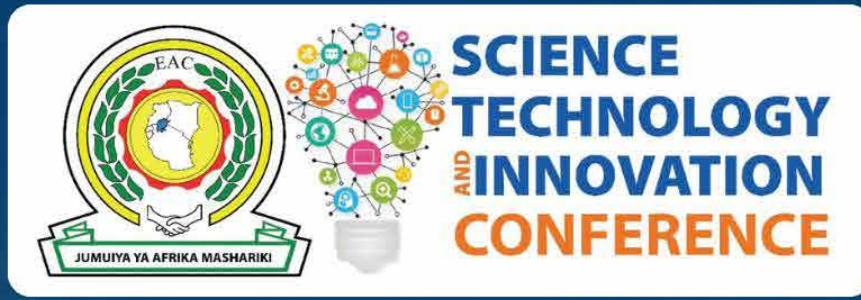


AI FOR EAST AFRICAN COMMUNITY 2026



EAST AFRICAN SCIENCE &
TECHNOLOGY COMMISSION
EASTECO



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4TH EAC REGIONAL SCIENCE, TECHNOLOGY AND INNOVATION CONFERENCE REPORT

THEME:
Harnessing Artificial Intelligence
for a Resilient, Inclusive
and Innovative
East Africa

30 MARCH - 1 APRIL 2026

KIGALI CONVENTION CENTRE, RWANDA

www.sti.easteco.org

Preface

The three-day 4th EAC STI Regional Conference was organized under the auspices of the East African Community by the following of its institutions:

- The East African Science and Technology Commission (EASTECO)
- The Inter-University Council for East Africa (IUCEA) with the support of:
- Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH

Acknowledgements

The organizers would like to thank all persons and organizations who played a role in making the conference a success, including the following:

- Ministers responsible for information, communication and technology in the region
- Ministers responsible for science, technology and innovation in the region
- Ministers responsible for EAC affairs in the region
- National councils/commissions of science, technology and innovation in the region
- Participating universities and research institutions
- The host – Republic of Rwanda

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Abbreviations and Acronyms

AGM	Annual General Meeting
ASALs	Arid and Semi-Arid Lands
AUDA-NEPAD	African Union Development Agency-New Partnership for Africa's Development
AI	Artificial Intelligence
AU	African Union
AU-ESTI	African Union Commissioner for Education, Science, Technology and Innovation
COYWA	Creating Opportunities for Youth and Women in Africa
DOI	Digital Object Identifier
EAC	East African Community
EAJSTI	East African Journal of Science, Technology and Innovation
EASTECO	East African Science and Technology Commission
GDP	Gross Domestic Product
GIZ	German Agency for International Development
ICT	Information and Communication Technology
IoT	Internet of Things
IUCEA	Inter-University Council for East Africa
KENET	Kenya Education Network
KSL	Kenyan Sign Language
MEACA	Ministries of East African Community Affairs
OECD	Organisation for Economic Co-operation and Development
OJS	Open Journal Systems
R&D	Research & Development
SDGs	Sustainable Development Goals
STEM	Science, Technology, Engineering and Mathematics
STI	Science, Technology and Innovation
UNESCO	United Nations Educational, Scientific and Cultural Organization



FOREWORD

The 4th EAC Regional Science, Technology and Innovation Conference, held from 30 March to 1 April 2026 at the Kigali Convention Centre, marked an important milestone in the region's efforts to harness artificial intelligence (AI) for sustainable development. Convened under the theme "Harnessing Artificial Intelligence for a Resilient, Inclusive and Innovative East Africa", it brought together ministers, senior government officials, academics, researchers, innovators and development partners from across the EAC Partner States and beyond to reflect on the transformative potential of AI in advancing the 7th EAC Development Strategy.

As the East African Science and Technology Commission (EASTECO), our mandate is to promote and coordinate the development and application of science, technology and innovation to accelerate socio economic transformation in the region. This conference, and the comprehensive post event report that follows, demonstrate how that mandate is being translated into action by convening high level policy dialogues, showcasing home grown innovation and nurturing an enabling ecosystem for responsible AI adoption in key sectors of our economies. The rich programme of plenary sessions, parallel scientific tracks, side events and innovation pitches underscored both the opportunities and risks of AI, and highlighted the urgency of investing in skills, infrastructure, governance frameworks and ethical standards tailored to our regional context.

This report distils the technical, operational and communication dimensions that underpinned the successful delivery of the conference, from broadcast grade livestreaming and multi camera production to comprehensive photography, venue branding and curated highlight and innovator films. These investments were designed not only to enhance the event experience, but also to extend the reach of the conference beyond the physical venue, ensuring that the knowledge generated is captured, preserved and shared with policymakers, practitioners, researchers and citizens across East Africa. The documentation presented here will serve as a practical resource for future conferences, partner institutions and all stakeholders committed to embedding AI into our regional development agenda in a responsible and inclusive manner.

I also wish to extend sincere appreciation to our partners and sponsors, including the EAC Secretariat, the National Commission for Science and Technology of Rwanda, line ministries from Partner States, AUDA NEPAD, GIZ and other international and regional organisations, whose collaboration and support were indispensable to the success of this conference. I commend the dedication of the organising committee, the scientific and technical teams, and Arthur Nation Ltd, whose professional execution of media production, hybrid infrastructure and event management ensured that the conference met high standards of quality. Above all, I acknowledge the contribution of scientists, innovators, youth and women entrepreneurs whose research, ideas and solutions were at the heart of the discussions and reminded us that East Africa has the talent and creativity to shape AI in ways that respond to our societal needs, uphold our values and advance regional integration.

Building on the outcomes of the conference, including the adoption of the Kigali Declaration on AI for East Africa, EASTECO reaffirms its commitment to working with all stakeholders to translate these deliberations into policies, programmes and investments that deliver tangible benefits for our people. It is my hope that this post event report will not only provide an accurate record of what was achieved in Kigali, but will also inspire continued collaboration, innovation and leadership in AI and, more broadly, in science, technology and innovation across the East African Community. See you in United Republic of Tanzania in March 2028 for the 5th EAC Regional STI Conference.

Dr. Sylvance Okoth
Executive Secretary
East African Science and Technology Commission (EASTECO)

EXECUTIVE SUMMARY

Introduction

The African Union (AU) Agenda 2063 and STISA 2034 prioritise innovation, digital transformation, and inclusive development. The strategic focus on AI is emphasised in the AU Continental AI Strategy (2024), which sets a people-centred, inclusive, and development-oriented roadmap for leveraging AI across sectors while safeguarding African values, ethics, and sovereignty. The AU Member States and Regional Economic Communities (RECs) are called upon to foster AI adoption in public services, promote responsible innovation, build AI research and infrastructure capacity, and strengthen global and regional cooperation.

In alignment with the global and continental aspirations, the East African Community (EAC) has demonstrated a forward-looking vision in placing Science, Technology and Innovation (STI) at the heart of its regional development agenda. The recently adopted EAC Regional Science, Technology and Innovation Policy (2023–2033) demonstrates a robust regional approach to emerging technologies by identifying digital technologies, Big Data, AI, biotechnology, and space science as among the key strategic focus areas.

The 4th EAC Regional STI Conference themed, “Harnessing Artificial Intelligence for a Resilient, Inclusive, and Innovative East Africa”, was designed to address and share solutions to the gaps and challenges that are related to the AI divide, limited skills, inadequate infrastructure, ethical deployment, governance frameworks and regulatory readiness, among others. The conference, convened in Kigali, Rwanda from 30 March to 1 April 2026, was the first to focus entirely on AI as a cross-cutting driver of innovation, digital transformation, and inclusive development.

The output of the conference will be published in the East African Journal of Science, Technology and Innovation (EAJSTI) to boost the dissemination of research findings within the region and improve regional visibility and competitiveness. The STI Conference will therefore stimulate the establishment and strengthening of strategic alliances among stakeholders to promote the generation, dissemination and translation of research findings; building collaborations and networks; and harness partnerships among stakeholders in the region.

Conference Format

The three-day 4th EAC STI Regional Conference was conducted in a hybrid mode through physical attendance and virtual platforms. The Conference engagement sessions will be structured into six (6) thematic areas, namely:

- i) AI for Agriculture and Food Security
- ii) AI for Health, Well-being, and Biomedical Innovation
- iii) AI for Education, Skills Development, and Research Excellence
- iv) AI for Climate Resilience, Environment, and Natural Resource Management
- v) AI for Industry, Service Delivery & Economy
- vi) AI Governance, Ethics, and Regional Cooperation

The following Plenary Sessions were held, each focusing on a theme that was addressed by a keynote speaker and panellists, followed by plenary discussions, as follows:

DAY 1

- Plenary Session 1: The Strategic Role of AI in East Africa's Development, Regional Transformation and Integration
- Plenary Session 2: AI Infrastructure, Research & Innovation Ecosystems in East Africa
- Plenary Session 3: Building a Skilled AI Workforce for the East African Community
- Plenary Session 4: Ethics and Responsible AI in the East African Community

DAY 2

- Plenary Session 5: The Role of Open Science and Diplomacy in Global and Regional AI Advancement
- Plenary Session 6: Side Events
- Plenary Session 7: Parallel Sessions—Paper Presentations

DAY 3

- Plenary Session 8: Women and Youth Innovation & Entrepreneurship
- Side Events
- Plenary Session 9: Powering AI with East African Data, Local Content and Languages
- Plenary Session 10: Young Innovators at the Forefront of Africa's AI Transformation
- Plenary Session 11: Ministerial Session

The AI4EAC Innovation Challenge winners were announced. The challenge brought together 110 universities, 3,852 registered participants, with 986 reaching the final weekend. A total of 5,126 submissions were made. Two strategies were launched: the EAC Regional Space Science & Technology Strategy 2023–2028 and the EAC Strategy on Innovation in the Informal Industrial Cluster.

The Plenary Sessions were supplemented with a total of nine Parallel Sessions held on the second day of the conference. These Parallel Sessions tackled various sub-themes and looked at case studies from around the region. At the end of the Plenary deliberations on the third day, a Ministerial Session was held attended by ministers and/or their representatives from EAC Partner States and at which the EAC Declaration on Artificial Intelligence was presented and endorsed by EAC ICT, STI and MEACA ministers.

General Overview of the Presentations

The presentations drew from the rich and diverse experiences of the keynote experts and panellists for each Plenary. There was much interest in the development and application of Artificial Intelligence in diverse areas that included agriculture, financial technology, education, health, climate change, open science, and other sectors. Similarities and differences in policies and approach among the partner states were explored, leading logically to serious examination of possible areas of policy convergence and collaborative ventures.

The deliberations did not, however, obscure the differing cultural, political and economic contexts of individual countries. These were evident in the various presentations and provided a strong argument for further discussion of some resolutions by higher organs of the Partner States using existing protocols and regional committees of the EAC.

Participation

The 4th STI Conference attracted 475 registered delegates from 18 countries. Of these, Rwanda contributed 159 participants (33.5%), while 273 participants (57.5 per cent) were international visitors. A total of 43 (9%) participants did not indicate their countries. These included all the EAC Partner States—Rwanda, Kenya, Uganda, Tanzania, Burundi, South Sudan, Somalia, and the Democratic Republic of Congo. Others who were represented were South Africa, India, the UK, Djibouti, Spain,

Ethiopia, France, Comoros, Mauritius, and Mozambique.

The conference also recorded 977 virtual registered participants. Rwanda accounted for the largest share in this category with 346 participants (35.4%), followed by Kenya with 216 participants (22.1%) and Uganda with 196 participants (20.1%). Tanzania and Burundi contributed 44 (4.5%) and 21 (2.1%) participants, respectively. Additional representation was recorded from Somalia, the Democratic Republic of Congo, Ethiopia, South Sudan, and the United States, although each of these accounted for less than 2% of total participation.

Conclusion

Participants were of the view that the 4th EAC Regional STI Conference had advanced on the progress made in previous conferences and arrived at far-reaching recommendations. It was left to individual institutions—principally the joint partners behind the conference—to take up the implementation of the conference resolutions and to report at the next conference.

INTRODUCTION

Background and Context

In this digital era, emerging technologies such as Artificial Intelligence (AI), Big Data analytics, Robotics, and the Internet of Things (IoT) are reshaping industries, institutions, and societies. The cross-cutting nature of AI provides the potential to globally revolutionize agriculture, healthcare, education, climate action, financial inclusion, infrastructure management, and public service delivery. The United Nations Sustainable Development Goals (SDGs) provide a shared roadmap for people, planet, and prosperity, of which AI has the potential to accelerate progress across the SDGs, particularly in poverty reduction, health, education, gender equality, climate action, and sustainable industry.

The 4th EAC Regional STI Conference was convened under the overarching theme of “**Harnessing Artificial Intelligence for a Resilient, Inclusive, and Innovative East Africa**”. This biennial Conference built on the deliberations and success of the first, second and third conferences, which were respectively held in Kampala, Uganda in 2019; Bujumbura, Burundi in 2021; and Nairobi, Kenya, in 2024. The Conference brought together diverse actors in the STI system, including policy makers, industry players, academicians, researchers, innovators, students and development partners.

This Conference brought together policymakers, researchers, innovators, private sector actors, development partners, and civil society to explore and share how East Africa can responsibly and strategically harness AI to shape the future of the region.

The deliberations and output of the 4th EAC Regional STI Conference will be documented with concrete resolutions, which will be disseminated for implementation to contribute to effective adoption and application of AI in the East Africa region. Full papers submitted to the conference will be peer-reviewed and evaluated based on originality, technical and/or research depth, accuracy and relevance to overall conference theme and thematic area. The accepted peer-reviewed papers will be published in the East African Journal of Science, Technology and Innovation (EAJSTI) to boost the dissemination of research findings within the region and improve regional visibility and competitiveness.

Purpose of the Conference

Despite the global momentum on AI and digital transformation, East Africa is grappling with diverse challenges, which include limited technical capacity, fragmented AI infrastructure, low investment in AI research, and absence of coordinated AI governance structures. These challenges threaten to widen regional disparities in adoption, application and utilization of AI for regional benefits. There is an urgent need to engage and share solutions and opportunities that will contribute to bridging these gaps through collaborative, inclusive, and forward-thinking actions.

Science, Technology, and Innovation (STI) have been central to regional integration and development strategies, including the EAC Treaty and Vision 2050. AI, as a cross-cutting general-purpose technology, can amplify the impact of STI investments by improving service delivery, enabling data-driven decision-making, and fostering entrepreneurship. Applications of AI in the EAC context range from precision agriculture and disease surveillance to personalized learning, automated public services, and urban planning

The 4th EAC Regional STI Conference presented a critical opportunity to bring together key stakeholders from government, academia, private sector, civil society, and development partners to share and contribute to development of AI technologies that are aligned with regional development and integration goals, while depicting our cultural, linguistic, and ethical values. This conference was therefore a critical platform for collective reflection, knowledge exchange, co-creation of ideas and partnership-building aimed at transforming the regional AI ecosystem.

The Conference was therefore both timely and strategic, reflecting the increasing global and regional recognition of Artificial Intelligence (AI) as a transformative force for development. AI has the potential to accelerate economic growth, enhance governance, and address structural challenges across the East African Community (EAC).

The conference served as a vital regional platform for policy dialogue, knowledge sharing, and strategic agenda-setting. By bringing together policymakers, technologists, researchers, entrepreneurs, and development partners, it will support the harmonization of AI policies and regulatory frameworks, identify shared challenges and opportunities, and build political momentum for investments in AI infrastructure and capacity.

Focusing on practical applications across sectors—including agriculture, health, education, climate, public service, and private enterprise—the conference raised awareness of AI's role in promoting efficiency, inclusion, and resilience. It also spotlighted current gaps in research, infrastructure, and skills, and promoted actions such as talent development, institutional strengthening, and regional infrastructure support.

In addition, the conference aimed to catalyse the formation of regional AI research hubs and foster cross-border collaborations in areas like data sharing, ethical AI, and innovation financing. It also nurtured knowledge networks to support small and medium enterprises (SMEs) and youth-driven innovation.

Finally, the conference advocated for a human-centred AI governance model tailored to the EAC context—emphasizing data privacy, fairness, and inclusivity—ensuring that AI solutions reflected local languages, cultures, and development priorities while mitigating the risk of digital exclusion.

Basing the engagement and conversation around the contribution of AI to the regional priority areas, while focusing on sustainable development, ethics and inclusion, the 4th EAC STI Conference was



more than a knowledge-sharing event but a platform to ensure that AI serves as a force for good. The Conference thus laid the groundwork for strategic alignment, capacity enhancement, multisectoral partnerships, inclusive growth and generation of political momentum that is needed to ensure that no one and no place is left behind in East Africa's AI-powered regional ecosystem.

Objectives of the Conference

Main Objective

To provide a regional platform for multi-stakeholder dialogue, knowledge exchange, and strategic collaboration on the responsible development and deployment of Artificial Intelligence (AI) to accelerate inclusive socio-economic transformation, enhancing resilience, and fostering innovation across key sectors in the East African Community.

Specific Objectives

- i. To facilitate high-level engagement among policymakers, academia, private sector, and civil society in AI policy and dialogue.
- ii. To provide a platform to showcase AI-driven solutions in key regional development priority areas.
- iii. To enhance the dissemination of AI research results through publication in peer review journal;
- iv. To stimulate and promote networking, partnerships and multi-stakeholder collaboration for AI ecosystem in the EAC region;
- v. To promote uptake of AI research and development products and services among STI stakeholders.

About the Conference

Scientific papers were presented on aspects of the various sub themes under each of the six thematic areas, but not limited to those areas. The conference was held in a hybrid mode through face-to-face and virtual platforms. The conference comprised a high-level policy dialogue, panel discussions, parallel presentations and showcasing events/Innovation exhibitions and ministerial session. The details of different sessions are:

- a. **High level policy dialogue session:** This will be organized involving senior government officials and Minister from ministries responsible for STI and ICT. The interactive high-level policy dialogue will focus on broad and cross cutting issues and strategic direction including opportunities and transformative levers, partnerships, commitments, actions and other measures to accelerate STI applications/solutions implementations.
- b. **Plenary Sessions:** A general plenary discussion will be held at the end of each session where key issues will be discussed, and session recommendations derived to inform conference resolutions.
- c. **Exhibition session:** Special sessions for exhibitions of scientific innovations and technologies will

be interspersed within the thematic sessions, in which participants will be allowed to visit exhibition booths of their interest to interact and learn.

- d. Ministerial terminal session:** A terminal ministerial session will be held to present consolidated recommendations to a technical policy panel for roundtable discussion to come up with forum resolutions. A detailed program will be developed to guide the conference structure
- e. Youth Innovation and Entrepreneurship Session:** This session will be youth-led AI startups and digital Innovations and presentations will be for young entrepreneurs and innovators in AI solutions.
- f. Special session and events:** Special sessions will be held on request from partners. This will include a youth engagement on technologies and innovation of the future and session on entrepreneurship promotion through education and research and development. Side events by partners will be held for special and specific sessions.

The expected outputs of the conference included:

- i. Book of abstracts and conference proceedings published
- ii. Selected peer-reviewed Papers published in a special volume of EAJSTI
- iii. A technical conference report published
- iv. Policy briefs published
- v. Consolidated and endorsed high-level policy recommendations and Resolutions from thematic sessions and the ministerial roundtable.
- vi. Youth AI-startups, Innovators and entrepreneurs showcased

The expected outcomes of the conference were:

- i. Enhanced networking relations among AI researchers, technology developers and innovators;
- ii. Established Platform for AI stakeholders for setting agenda as well as priorities and niches;
- iii. Enhanced AI linkages and partnerships between academia, industry and the public sector;
- iv. Enhanced AI capacity for exchange of scientific ideas among researchers, faculty, and industrialists in the region.
- v. Increased awareness and capacity in AI among youth, academia, government, and private sector.
- vi. Uptake and scaling of AI-driven solutions in agriculture, health, education, climate resilience, and service delivery.
- vii. Stronger linkages between AI research and policymaking, promoting evidence-based and people-centred digital transformation.

The conference was open to diverse stakeholders including policymakers from Government ministries, agencies, and parliamentary committees, representatives of African Union and regional economic blocs, private sector/Business Community representatives, academia and research community, innovators, representatives of innovation hubs/ incubators and entrepreneurs support organizations, youth, civil society representatives, and development partners.



DAY ONE

Day One of the STI Conference highlighted science, technology, and innovation as drivers of Africa's economic transformation. Sessions focused on AI, digital transformation, research commercialization, and building strong innovation ecosystems through collaboration among government, academia, and industry. Speakers stressed increased R&D investment, supportive policies, and regional cooperation to help Africa become a producer of innovation and technology.

The first Plenary Session focused on the theme of "The Strategic Role of AI in East Africa's Development, Regional Transformation and Integration," while the second Plenary Session had as its theme, "AI Infrastructure, Research & Innovation Ecosystems in East Africa." The theme of the third Plenary Session was, "Building a Skilled AI Workforce for the East African Community." All these themes were ably tackled through keynote presentations and panellist sessions followed by enlightening plenary discussions.

OPENING CEREMONY

Masters of Ceremonies



Dr. Fortunate Muyambi,
Deputy Executive Secretary,
EASTECO



Dr. Salome Guchu
Principal Innovation
Outreach Officer, IUCEA

Prof. Idris Rai, Ag. Executive Secretary, IUCEA



The Ag. Executive Secretary of the Inter-University Council for East Africa welcomed delegates to the 4th EAC Regional Science, Technology and Innovation Conference in Kigali, noting that the forum, established in 2019 in collaboration with EASTECO, serves as a platform to advance science, technology and innovation for regional integration and sustainable development. The speaker acknowledged the presence of ministers and partners, emphasizing the importance of the conference theme on harnessing artificial intelligence (AI) for a resilient and inclusive East Africa.

He observed that AI is already transforming key sectors such as education, health, agriculture, and governance, while also posing challenges that require coordinated regional responses. Although AI has long existed in academia, its widespread impact accelerated in 2022 with tools like ChatGPT, exposing gaps in the region's higher education systems. It was noted that universities are not yet adequately prepared, facing shortages in skilled personnel, relevant curricula, and infrastructure.

The speaker highlighted IUCEA's efforts to address these gaps through capacity building, policy development, and the establishment of a regional AI centre, as well as partnerships with various international organizations. They concluded by urging stakeholders to collaborate strategically to harness AI for inclusive growth, resilience, and regional transformation.

Dr. Sylvance Okoth, Executive Secretary of EASTECO



Dr. Sylvance Okoth welcomed participants and expressed appreciation for their attendance. He emphasized that artificial intelligence (AI) is already a transformative force with the potential to reshape learning, innovation, and development, while also helping to address regional challenges. He noted that the conference aligns with key regional and continental frameworks, including the EAC STI Policy, STISA 2034, and the African Union agenda. However, he highlighted persistent challenges such as limited AI infrastructure, inadequate investment in research and innovation, and fragmented data governance.

To address these gaps, he pointed out that EASTECO and IUCEA, in collaboration with GIZ, have established a Regional AI Alliance to coordinate efforts in policy development, skills and talent building, and research and infrastructure development.

He further recommended that the conference serve as a platform for policy dialogue, partnerships, and knowledge sharing across sectors such as education, health, agriculture, and climate. He concluded by stressing that AI must be contextualized to local realities in order to effectively support an inclusive and resilient East African region.

Hon. Prof. Gaspard Banyankimbona, Commissioner AU-ESTI



In her remarks delivered on behalf of the African Union Commissioner for Education, Science, Technology and Innovation, Ms. Maharat Fishone expressed appreciation to the Government of Rwanda and the conference organizers for convening the forum and for their leadership in advancing the science, technology, and innovation agenda in Africa.

She noted that the East African Community continued to play a pivotal role in advancing the continental STI agenda, particularly under the AU's STISA 2034 framework, and emphasized the importance of strong coordination between regional economic communities and the African Union. She stated that artificial intelligence was no longer a future prospect but a present-day catalyst for development, with the potential to transform sectors such as health, agriculture, climate resilience, and public service delivery. From a continental perspective, she explained that AI should be treated as a cross-cutting enabler aligned with Africa's development priorities and values.

She emphasized that human capital development must remain central, highlighting the need to integrate AI skills across education systems, strengthen STEM research, and support universities and TVET institutions as innovation hubs. She warned that without adequate skills, AI could deepen inequalities, but with the right investments, it could become a powerful tool for empowerment.

She further underscored the importance of regional integration and policy harmonization, noting that coordinated approaches to AI governance, data frameworks, and infrastructure would enhance investment, enable cross-border services, and strengthen collective capacity.

She highlighted the role of global partnerships, including recent cooperation initiatives, while stressing that such engagements must align with Africa-centric priorities. She also emphasized the need for ethical, inclusive, and trustworthy AI systems that reflect African values and protect data sovereignty.

In conclusion, she affirmed that AI could accelerate the region's development if it was people-centred, policy-driven, regionally coordinated, and ethically governed, and called for a shift from dialogue to implementation, with the African Union ready to support the outcomes of the conference.

Hon. Andrea Aguer Ariik, Deputy Secretary General, East African Community



Hon. Andrea Aguer Ariik, Deputy Secretary General of the East African Community, acknowledged the strong collaboration between EASTECO and IUCEA as sister institutions under the EAC, noting that their partnership reflects a shared commitment to regional coordination. He emphasized the critical role of collaboration and partnerships in advancing science, technology, and innovation across the region.

He observed that artificial intelligence (AI) presents a significant opportunity to drive regional integration and economic development, particularly in sectors such as health, education, and agriculture. He further highlighted the Regional AI Alliance as an important platform for coordinated regional action.

Additionally, he noted ongoing joint efforts by EASTECO and IUCEA to develop a regional AI strategy and network aimed at addressing key issues such as skills development, infrastructure, research and innovation, and regulatory frameworks. He concluded by underscoring the need for stronger collaboration between academia and industry to ensure that AI adoption, deployment, inclusivity, and ethical considerations effectively benefit the people of the EAC region.

Hon. James Magode Ikuya, Chair of The Council of Ministers EAC and Minister of State, EAC Affairs, Uganda



Hon. James Magode Ikuya welcomed participants and expressed gratitude to the Government of Rwanda for hosting the conference. He underscored the importance of knowledge and innovation in addressing societal challenges and advancing development, noting that knowledge should ultimately empower societies to overcome human challenges.

He emphasized that artificial intelligence (AI) holds significant potential to drive economic transformation and deepen regional integration, and called on the region to embrace AI as a catalyst for EAC economic development. He further stressed the need to invest in youth skills and capacity building to ensure meaningful participation in an AI-driven economy.

He concluded by advocating for the development of an inclusive and resilient AI ecosystem that supports regional integration and delivers broad-based benefits across East African societies.

Keynote Speech - Applications of AI in strengthening the science, technology and innovation ecosystem

Prof. Shaukat Abdulrazak, Principal Secretary, State Dept for Science, Research & Innovation, Kenya



In his keynote presentation, Prof. Shaukat Abdulrazak explained that AI was already transforming key sectors such as health, industry, agriculture, and climate and energy. He noted that in healthcare, AI was enhancing drug discovery, diagnostics, and medical modelling, while in industry it was driving productivity and innovation. In agriculture, he observed that AI was improving irrigation systems, satellite imaging, and harvesting processes, and in climate and energy it was supporting demand forecasting and supply chain optimization.

He stated that AI should be regarded as a foundational technology for accelerating economic growth within the East African Community, and stressed the need to move from its potential to practical implementation. He highlighted global projections estimating AI could contribute up to USD 15 trillion to the world economy by 2030, with East Africa potentially gaining between USD 150 and 200 billion by 2034.

Prof. Abdulrazak emphasized the importance of developing national AI strategies, policies, and regulatory frameworks that balance innovation with ethical considerations. He underscored the need to increase investment in research and development to at least 1% of GDP, while also building local technological solutions and strengthening talent development.

He further called for increased investment incentives, stronger public-private partnerships, and the establishment of AI Centres of Excellence. He advocated for expanded doctoral training and closer collaboration among academia, industry, and government. In addition, he recommended building national and regional computing and data centres to support data analytics and evidence-based decision-making.

He proposed the creation of an AI innovation fund, alongside infrastructure, capacity-building measures, and incentives to encourage private sector participation. He also recommended developing a robust AI talent pipeline aligned with key sectors, including specialized programmes in TVET and higher education, as well as regional talent mobility initiatives.

He concluded by emphasizing the importance of promoting localized STI and AI solutions, noting that the future would belong to those who effectively combine technical expertise with human capacity.

Ministerial Statements from Partner States

Hon. Ambassador Mahmoud Thabit Kombo, Minister of Foreign Affairs and EAC, Tanzania



Hon. Amb. Mahmoud Kombo began his address by acknowledging the presence of his fellow ministers from other East African countries, representatives of development partners, researchers, innovators, and other participants.

The 4th STI Conference, he said, comes at a critical time when the region is positioning itself to harness emerging technologies to accelerate development and wellbeing of its people. Across the world, he added, AI is transforming economies and reshaping the way governments deliver their services. In East Africa, AI represents a powerful catalyst for the wellbeing and development of East Africans in areas such as agriculture, education, healthcare, and climate resilience.

The EAC Vision 2050, the minister said, was in line with Tanzania's own recently-launched Vision 2050. This calls for Partner States to build a competitive knowledge-based regional economy driven by science and technology innovations.

Digital transformation and innovation, he said, have become central pillars of Tanzania's national agenda. AI is a catalyst for inclusive development and improved service delivery, he added. High-speed connectivity has been expanded within Tanzania and with neighbouring Partner States, the minister said.

The digital economy framework is guiding Tanzania's efforts to integrate digital transformation and strengthen digital entrepreneurship, the minister said, from the education system all the way to the private sector. Tanzania, he said, hosts more than 30 innovation hubs which are fully financed and supported by the government.

Hon. Ateny Wek Ateny, Minister of Information and Postal Services, South Sudan



The minister from South Sudan highlighted the country's rich linguistic and cultural diversity as both a challenge and an opportunity for digital transformation. He noted that South Sudan is home to over 60 communities with multiple spoken languages, alongside the use of Kiswahili and various forms of Arabic. This diversity, he observed, presents a strong case for the application of artificial intelligence and other emerging technologies, particularly in areas such as language processing and inclusive digital systems.

The minister emphasised the need for a common regional framework that reflects African cultural values and environmental realities. He argued that such a foundation is essential for leveraging technology to support socio-economic development. In this regard, he called for greater focus on harnessing both human and natural resources—including land, water, and mineral wealth—through technological innovation.

Referencing South Sudan's Vision 2040, he noted that its goals are closely aligned with broader African Union and East African Community development frameworks. However, he pointed out that progress is often hindered by fragmented efforts, environmental constraints, and cultural diversity, which contribute to disparities in economic opportunities and livelihoods across the region.

The minister expressed confidence that advancements in ICT, particularly artificial intelligence, can help bridge these gaps. He highlighted the potential of AI to enhance productivity and support key sectors such as construction, manufacturing, education, and research, thereby enabling governments and communities to achieve their development objectives more effectively.

In closing, he commended the organisers of the conference, including the East African Science and Technology Commission and the Inter-University Council for East Africa, for successfully convening stakeholders. He also expressed gratitude to Rwanda for its hospitality, noting the warm reception and sense of regional solidarity experienced by his delegation in Kigali.

Dr. Tom Kariuki, Founding CEO, Science for Africa Foundation



In remarks delivered on his behalf by Dr. Moses Alobo, Dr. Tom Kariuki explained that the institution's mission was to support, strengthen, and promote science in Africa from research to impact. He stated that the Foundation had actively contributed to the East African Community's STI agenda, particularly by supporting over 20 AI innovators across the continent through grant funding and partnerships.

He reported that these innovators—many based in East Africa—were developing AI solutions in sectors such as health, agriculture, and climate, demonstrating both strong local talent and global competitiveness. However, he noted that their progress was constrained by challenges including limited digital infrastructure, restricted access to quality data, fragmented funding, and weak or short-term partnerships.

He emphasized that the Foundation was engaged in advancing AI within the region through initiatives such as innovation grants, partnerships with regional bodies, and support for commercialization and public-private collaboration. He added that these efforts aimed to promote a digitally unified East Africa built on shared infrastructure, data systems, and collaborative frameworks.

He further highlighted the need to treat digital and data infrastructure as regional public goods, improve access to high-quality data—especially from governments—and ensure that AI development is grounded in ethics and public trust.

In conclusion, he affirmed that the Foundation was committed to working with governments, regional institutions, and innovators to strengthen the AI ecosystem, stressing that collective action would be essential for building a digitally integrated region where AI drives inclusive development.

Louise Haxthausen, Director, UNESCO Regional Office for Eastern Africa



In her remarks, Louise Haxthausen stated that UNESCO valued its partnership with regional institutions in convening the conference and welcomed the focus on artificial intelligence as a timely opportunity to drive concrete actions for regional integration and sustainable development. She commended the emphasis on AI sovereignty and noted that UNESCO's work was grounded in its global framework on the ethics of AI, which promotes human-centred, responsible, and ethical AI systems. She added that this commitment was aligned with broader international and regional frameworks, including the UN Global Digital Compact and the African Union Continental AI Strategy, underscoring the importance of policy coherence in managing both opportunities and risks associated with AI.

She highlighted UNESCO's AI Readiness Assessment Methodology, which had been implemented in numerous countries, including several in East Africa, to support evidence-based policymaking, strengthen governance, and identify gaps in infrastructure, skills, and data systems. She also acknowledged ongoing capacity-building efforts, including partnerships supporting training and technical expertise.

She further noted UNESCO's role in advancing AI across education, science, culture, and communication, including through initiatives such as Campus Africa, which supports research, doctoral training, and higher education, as well as collaboration with regional AI alliances.

She announced upcoming regional training initiatives on data governance in partnership with regional organizations, aimed at strengthening regulatory capacity. She also emphasized the importance of cultural and linguistic diversity in AI development, noting the recognition of Swahili as an official UNESCO language as an opportunity to advance local language AI models.

In conclusion, she affirmed that AI presents a significant opportunity to transform knowledge systems and innovation in Africa, and stressed the need for intentional, coordinated action to create an enabling environment, reiterating UNESCO's commitment to supporting the region's AI agenda.

Norman Schraepel, GIZ Cluster Coordinator, Rwanda



The speaker gave several recommendations for the conversations in the conference. AI is not a technology fix, he said, in that the technology will not resolve problems but how it is used.

Secondly, he pointed at collaboration, saying this is difficult to implement but should be encouraged in order to build on what is already available.

Thirdly, the question of application of AI needs to be resolved, by focusing on use cases in the region.

Barbara Barone, European Union, Dar es Salaam, Tanzania



In her remarks, Barbara Barone commended the convening of the 4th EAC Regional STI Conference and noted that the strong participation reflected a shared understanding of the strategic importance of artificial intelligence for the region's development agenda.

She emphasized that AI requires scale in data, talent, markets, and infrastructure, alongside trust and a human-centred approach to ensure that technology serves people. She observed that regional cooperation within the East African Community was essential to achieve interoperability, common standards, and shared digital infrastructure, which could ultimately support AI sovereignty for the region.

She outlined the EU's digital partnership with Africa under the Global Gateway strategy, highlighting its significant investment framework aimed at mobilizing resources for digital transformation across infrastructure, connectivity, data systems, and innovation ecosystems. She cited initiatives supporting data centres, digital services, AI startups, and governance frameworks, as well as partnerships with regional institutions to strengthen digital capacity.

She further explained that the EU's approach to AI is built on three pillars: regulation, investment, and adoption. She referenced the EU AI Act as a pioneering legal framework designed to balance innovation with risk management, and noted substantial investments in supercomputing infrastructure and emerging AI factories intended to support both European and African partners. She highlighted ongoing collaboration with the East African Community, including support for digital transformation programmes in areas such as e-commerce, e-governance, cybersecurity, and payments, as well as joint initiatives with development partners to strengthen regional capacity.

She also commended the establishment of the EAC AI Alliance and related innovation programmes that are building regional AI skills and supporting youth participation through hackathons and innovation challenges. She described these as strong examples of regional leadership with potential for scale-up and deeper EU partnership.

In conclusion, she stated that the pace of the AI revolution required urgent action, scale, and strategic partnerships, and encouraged continued dialogue and coordination to shape a competitive and inclusive digital future for the region.

H.E. Nardos Bekele-Thomas, CEO, AUDA-NEPAD



In remarks delivered on her behalf by Prof. Brandon Okoro, AUDA-NEPAD CEO Nardos Bekele-Thomas explained that artificial intelligence should not be viewed only as a software-driven innovation, but as a system whose foundations lie in physical resources, energy, data, and governance.

She noted that AI hardware depends heavily on critical minerals such as copper, silicon, rare earths, and graphite, and emphasized that the global competition for AI is therefore also a competition for access to these resources. She highlighted Africa's role as a significant supplier of key minerals and pointed to East Africa's untapped geological and industrial potential.

She further stressed that beyond hardware, AI systems are shaped by data and ethical frameworks,

making issues of inclusion, fairness, and governance central to how the technology develops. In this context, she underscored the importance of African languages, particularly Kiswahili and English in East Africa, as strategic assets that could determine how effectively local populations engage with AI systems.

She also highlighted the region's geothermal energy potential, particularly in the Rift Valley, as a major advantage for powering energy-intensive AI infrastructure such as data centres. She noted that investments in renewable, geothermal-powered computing infrastructure, alongside local language model development, position East Africa as an emerging hub in the global AI landscape. She emphasized that AI presents a strategic choice for Africa: to either become architects of the transformation or remain consumers of externally developed systems. She argued that East Africa has the capacity to contribute across the full AI value chain, including resource supply, energy, data, language model development, application design, and governance frameworks.

In conclusion, she stated that aligning these elements within a coherent strategy would enable the region not only to participate in the AI revolution but to shape it, and she referenced the African Union's STISA 2034 framework as an important guiding instrument for this transformation.

William Baraza, CEO, African Advanced Level Telecommunications Institute (AFRALTI)



In his official opening remarks, William Baraza noted that the region's population had grown from about 1.4 billion people to 1.58 billion people. Internet connectivity now stands at about 38% to 43%. We now have seven submarine Internet cables at the East African coast, specifically Mombasa.

Baraza demonstrated that AI is now in everyday life, giving the example of doors that open and close automatically, hence meaning they have a level of intelligence but without memory or recollection, which would require further reprogramming to instal. Simple PCs, too, have a level of intelligence and memory. What is driving current discourses on AI, however, is the level of Internet connectivity. The cost of computing power has also come down.

About 700-800 million Africans are not connected to the Internet, with East Africa leading with about 570 million people. All these people missing connectivity need to be meaningfully connected. Universal development, skills development, protectionism and harmonisation of regulations, electricity connectivity, and infrastructure development all need to be looked at, he said.

Our data sources are fragmented, and this also requires attention, the speaker said. Collection of data is important to support the various sectors of development.

Dr. Humphrey Agevi, Director, Programmes, Africa Research and Impact Network (ARIN)



Dr. Humphrey Agevi conveyed the apologies of the Executive Director of the Africa Research and Impact Network, who could not attend as he was on official duty in The Netherlands. The organisation is a think-tank based in Nairobi but operating in 36 African countries.

The think-tank works to generate evidence that informs policy—such as what works and what does not work. East Africa, the speaker said, stands at an intersection of climate vulnerability and digital opportunity. The region has faced extreme events in recent years, he said, including droughts and floods, leading also to the loss of biodiversity.

The key question, Dr. Agevi said, is on how to integrate AI into existing engagements to serve people and systems as well as build resilience. Data alone does not build resilience, he added, but the need for actionable intelligence helps in building resilience. ARIN is involved in varied projects in this regard, he said, and gave an overview of these activities. In the process, the organisation also helps to integrate community knowledge with AI systems. They also align the various metrics with global frameworks.

He emphasised the importance of co-designing AI solutions with local communities; reflect on ecological, cultural and socio-economic contexts; and address non-economic losses. All these will help in ensuring equity, legitimacy, and long-term sustainability.

Paula Ingabire, Minister of ICT and Innovation, Rwanda



In her official opening address, Paula Ingabire welcomed participants to the conference and stated that it was taking place at a critical moment marked by global challenges such as geopolitical instability, climate change, and economic uncertainty. She noted that in such contexts, science, technology, and innovation - particularly artificial intelligence - were essential tools for building resilience and driving inclusive development.

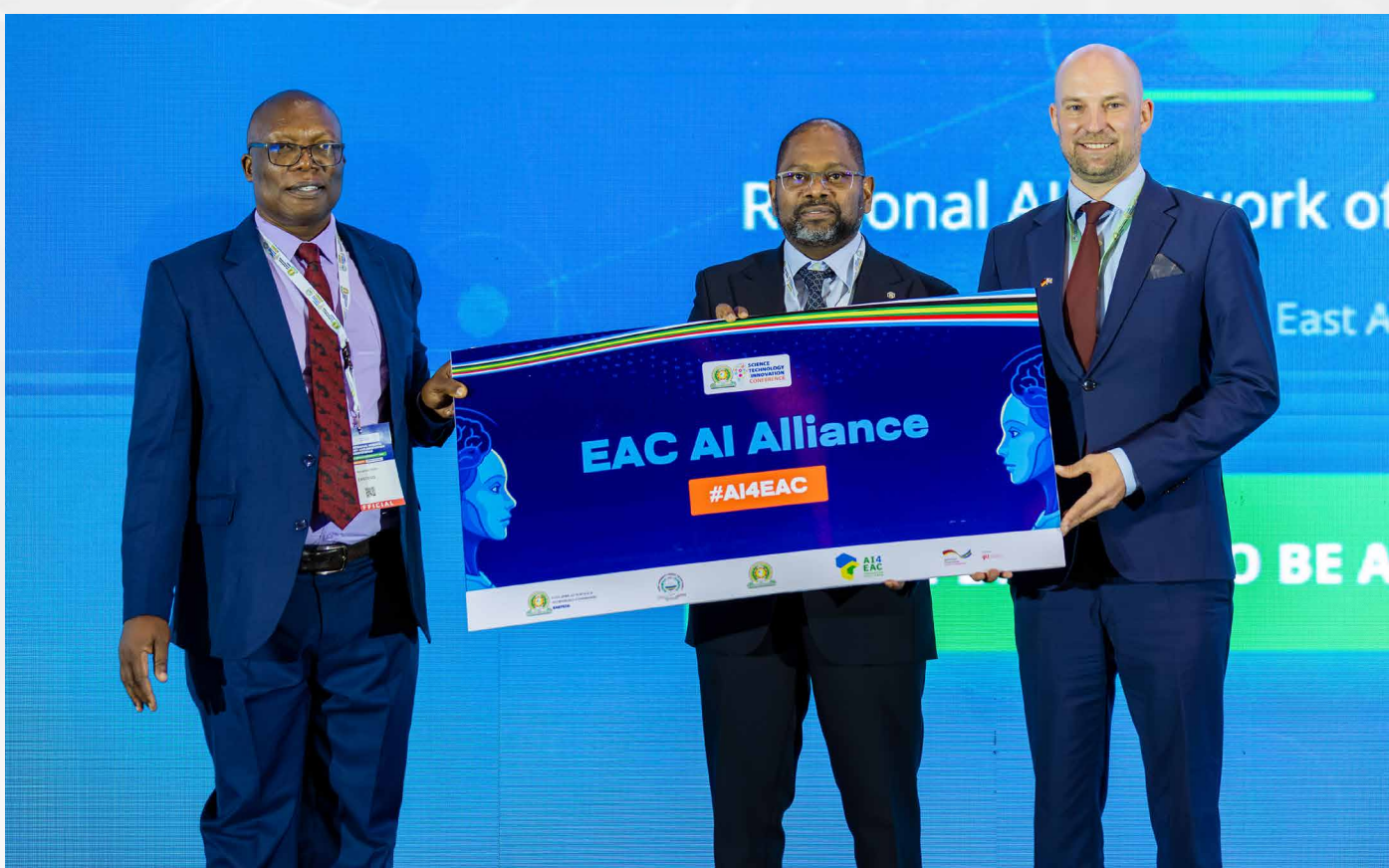
She observed that AI was already transforming economies and emphasized that East Africa must not remain a passive consumer of externally developed systems, but should instead position itself as a leader by building its own capabilities. She highlighted the region's existing digital progress, including widespread mobile connectivity and growing internet usage, as a strong foundation for scaling AI solutions. She cited practical examples from across the region where AI was already delivering impact in agriculture, healthcare, and financial inclusion.

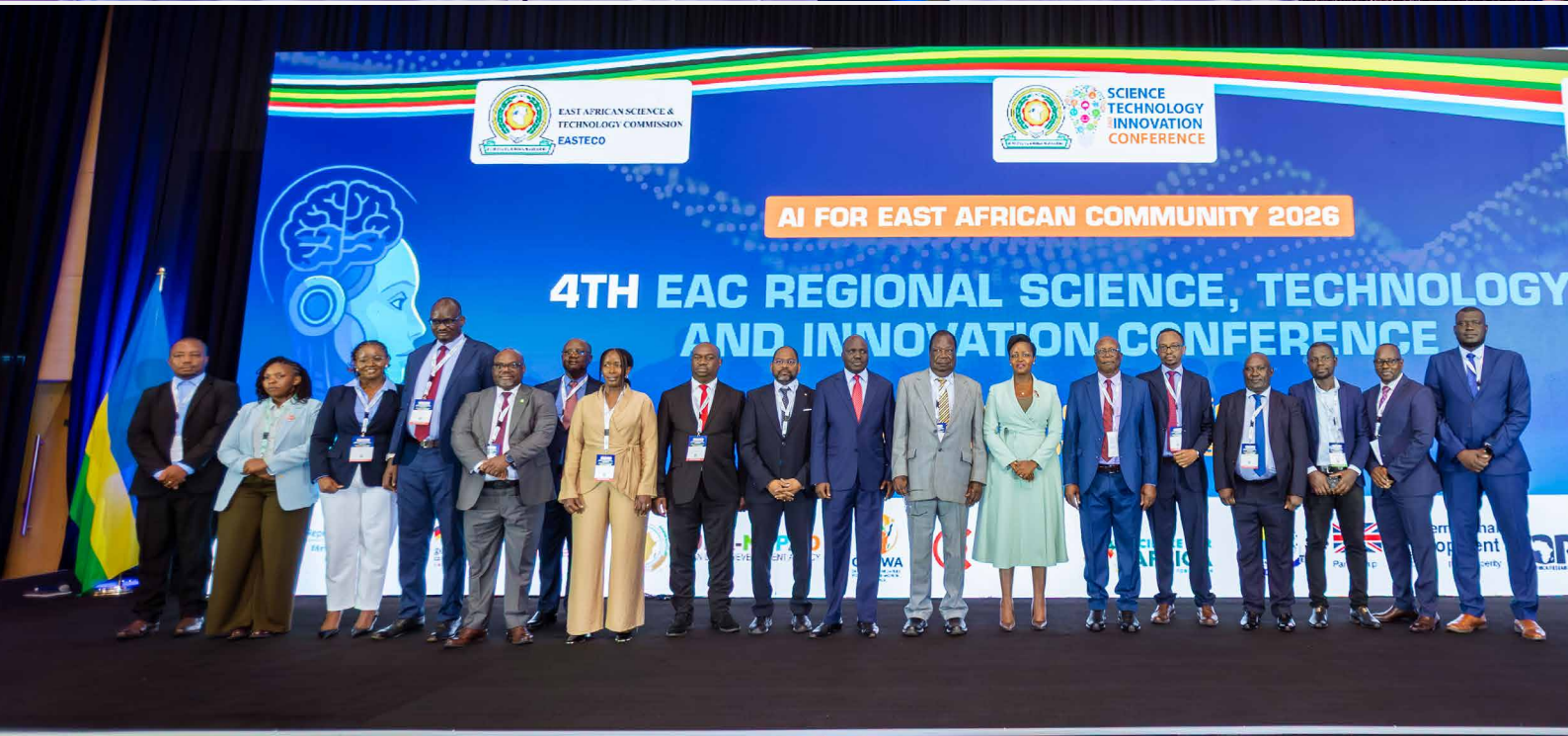
She stressed the importance of investing in AI research institutions, developing local datasets in African languages, and strengthening education and skills development to produce a new generation of AI researchers and innovators. She also underscored the need for stronger regional collaboration, including linking innovation ecosystems, pooling resources for research and development, and expanding cross-border investment mechanisms.

She further emphasized the concept of AI sovereignty, explaining that East African countries must retain control over their data, regulatory frameworks, and the economic value generated by AI. She argued that achieving this would require coordinated regional action in areas such as infrastructure development, harmonized regulation, and participation in global AI governance.

Formal Launch: Call for AI in Education & Research Nodes

Prof. Idris Rai, the Ag. Executive Secretary, IUCEA, officiated the launch of the call of a regional AI network with the purpose to promote collaboration and partnership engagements between universities, industry and government for research and capacity building and policy dialogue. This call is part of the EAC AI Alliance platform to drive coordinated action in AI research, innovation, skill development and policy dialogue.





PLENARY SESSION 1

The Strategic Role of AI in East Africa's Development, Regional Transformation and Integration

Preamble

AI is transforming economic growth, governance, and social development globally. In East Africa, AI offers significant opportunities to accelerate regional transformation by improving productivity, public service delivery, and innovation. It supports evidence-based policymaking and enhances competitiveness across key sectors, including agriculture, health, education, trade, and industry. AI can also help address unemployment, climate vulnerability, and infrastructure challenges. However, maximizing its benefits requires coordinated regional investment, capacity building, ethical governance, and strong collaboration among governments, academia, private sector, and development partners.

Keynote Presenters



Olivier Twagirayezu,
Centre of Fourth
Industrial Revolution –
Rwanda



**Nakul Jain, CEO &
Managing Director,**
Wadhvani AI Global

Title of Presentations: AI as a Cross-Cutting Driver of Resilient and Inclusive Growth in East Africa.

Session Moderator: Jade Makory, Regional Digital Transformation and AI Advisor

Session Rapporteur: Dr. Marie Chantal Cyulinyana

Panelists:

- Maria Namyalo, APET, AUDA-NEPAD
- Steve Kisakye, Co-Founder and Partner, Axum
- Suraj Juddoo, Senior Lecturer and AI Consultant, UNDP & Middlesex University

Keynote Presentation: Olivier Twagirayezu

In his keynote remarks, Olivier Twagirayezu stated that artificial intelligence should be understood not as a standalone sector, but as a general-purpose enabler capable of transforming all sectors of the economy.

He observed that AI was already reshaping key areas such as healthcare, education, agriculture, and urban management by improving diagnostics, enabling precision farming, and personalizing learning. He emphasized that, if properly harnessed, AI could act as a powerful multiplier of development outcomes across the region.

He noted, however, that AI transformation does not happen automatically and requires intentional policy design, strong governance, and disciplined implementation. He highlighted Rwanda's efforts to position AI as a driver of socio-economic transformation through its national

AI policy, data governance frameworks, and initiatives such as the Rwanda AI Scaling Hub, which aim to translate strategy into practical impact.

He stressed that responsible AI is not a constraint but a foundation for trust, adoption, and long-term impact. He further underscored that no country can fully realize AI's potential alone, as it requires scale in data, talent, infrastructure, and markets, making regional collaboration essential.

He called for strengthened East African cooperation through harmonized policies and regulations, trusted cross-border data flows, shared infrastructure, and a coordinated innovation and talent ecosystem. He also outlined five guiding priorities: responsible deployment, adaptive institutions, sustainable scaling beyond pilots, alignment with national development goals, and inclusive innovation that reflects local languages and contexts.

In conclusion, he stated that Africa must move from being a consumer of AI to a creator of solutions, emphasizing that data is a strategic asset and trust is central to the AI economy. He posed the question of whether Africa will shape AI or be shaped by it, and urged collective action to ensure AI becomes a driver of inclusive and resilient growth in the region.

Keynote Presentation: Nakul Jain

In his keynote address, Nakul Jain emphasized the importance of shifting away from dependency-based international partnerships toward more equitable South–South collaboration, where AI solutions are locally adapted, co-created, and owned.

He noted that AI readiness is primarily an institutional challenge rather than a purely technical one, stressing the need for strong leadership alignment, capable public sector institutions, and robust data governance systems to enable meaningful adoption.

He presented the concept of embedded AI as a key deployment model, in which artificial intelligence is integrated directly into government systems and workflows to enhance decision-making and service delivery, rather than functioning as standalone tools.

He further identified critical enablers for successful AI adoption, including strong public digital infrastructure, reliable and well-structured data systems, and effective accountability mechanisms to ensure transparency and trust.

He also highlighted that Africa's resource-constrained innovation environment should be viewed as an advantage, as it encourages the development of efficient, scalable, and resilient AI solutions tailored to real-world constraints.

In conclusion, he proposed that success in AI should be redefined beyond measures such as computing power or investment size, and instead assessed based on real-world impact, system strengthening, and the extent to which solutions improve service delivery and reach underserved populations.

Panel Discussion

In her contribution to the panel, Maria Stella Namyalo observed that many African countries are increasingly embedding artificial intelligence within broader digital transformation agendas, rather than developing standalone AI policies. She noted that this approach reflects ongoing continental efforts under the African Union's strategic frameworks, including alignment with Agenda 2063 and emerging continental AI strategies.

She highlighted the progress being made on data sovereignty, particularly through initiatives aimed at strengthening regional data infrastructure and establishing robust governance frameworks to ensure that African data is securely managed and effectively utilized for development.

She also pointed to efforts to integrate African languages into AI systems as a key priority for improving inclusivity and ensuring that technological solutions reflect the linguistic and cultural diversity of the continent.

She recommended stronger regional policy harmonisation and enhanced cross-border data governance mechanisms to support scalable and coordinated AI deployment across African countries. In addition, she proposed the introduction of a "research passport" to facilitate easier mobility for researchers across borders, thereby strengthening collaboration, knowledge exchange, and innovation within the region.

In his contribution, Steve Kisakye observed that limited access to patient capital remains a significant constraint for early-stage AI startups across the region. He noted that many promising innovations fail to scale due to weak market access and insufficient operational readiness.

He further highlighted that public procurement systems often create barriers that limit the participation of startups in government-led AI deployments, thereby reducing opportunities for local innovators to demonstrate and scale their solutions. He also pointed to broader infrastructure challenges, including underutilized internet capacity and persistent gaps in rural connectivity.

He recommended the establishment of a regional AI marketplace, improved access to public procurement systems for startups, and the mobilisation of targeted financing mechanisms to support the scaling of innovation across the ecosystem.

In a related intervention, Suraj Juddoo emphasized that Africa's large youth population represents a major asset for building sustainable AI ecosystems. However, he noted a persistent mismatch between academic training and labour market needs, which limits the effective deployment of AI skills in practice.

He observed that concerns about job displacement are also contributing to low uptake of AI education and specialization among young people. In addition, he highlighted significant capacity gaps within the public sector, particularly in areas such as procurement, regulation, and technical oversight of AI systems.

He recommended accelerated, industry-aligned training programmes, stronger collaboration

between academia and industry, and increased investment in shared regional infrastructure such as computing and research platforms to support innovation and skills development.

Across the discussions, a strong consensus emerged that many AI initiatives in Africa fall into a “pilot trap,” where projects are not designed for scale from the outset. Participants agreed that non-technical factors—including policy gaps, financing constraints, and infrastructure limitations—are the primary barriers to meaningful AI impact. They further emphasized that regional coordination and shared infrastructure are essential for competitiveness, and that AI success should ultimately be measured by real-world impact and system-wide transformation rather than the number of pilots or strategies produced.



KEY POINTS AND EMERGING ISSUES

The discussion underscored the need for a coordinated East African approach to artificial intelligence, anchored in a shared regional framework that aligns national strategies, policies, and regulatory systems across Partner States.

Participants emphasized the importance of building enabling regional infrastructure, including shared data systems, interoperable platforms, and computing resources, to support cross-border innovation and scalable AI deployment. This includes the development of a regional AI platform to facilitate sandboxing, public procurement, and performance monitoring, as well as the creation of an East African AI marketplace to connect talent, funding, and innovation opportunities.

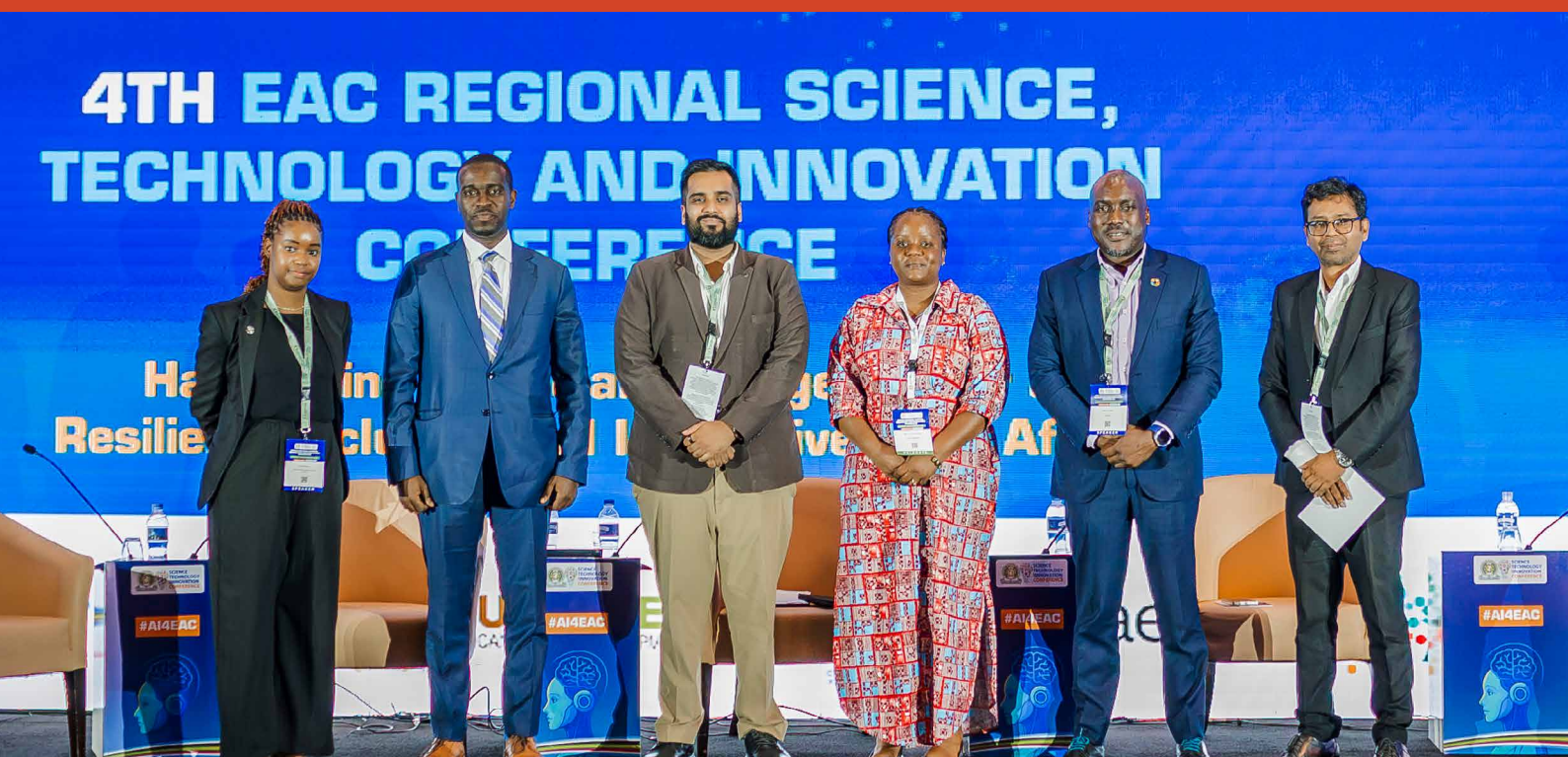
A strong focus was placed on strengthening data governance and trust frameworks through ethical guidelines, data protection standards, and mechanisms that ensure responsible and accountable use of AI. Closely linked to this was the call to promote African languages in AI systems, including support for initiatives advancing local language models.

The discussion also highlighted financing and market access challenges facing startups, calling for improved access to patient capital, reform of public procurement systems, and stronger roles for governments as early adopters and market enablers of innovation.

Participants further stressed the need to invest in AI talent development through industry-aligned training, academic–industry collaboration, and fast-tracked capacity-building programmes. They also called for deeper collaboration among governments, academia, the private sector, and development partners to accelerate innovation and deployment.

Sector-specific AI applications in areas such as agriculture, health, and education were identified as priorities to ensure tangible, citizen-centred impact. In addition, South–South collaboration and knowledge exchange were encouraged to strengthen learning across regions.

Finally, the discussion highlighted the importance of embedding monitoring, evaluation, and learning mechanisms from the outset of AI initiatives to ensure scalability, accountability, and long-term impact, while reducing the common “pilot trap” that limits many innovations.



PLENARY SESSION 2

AI Infrastructure, Research & Innovation Ecosystems in East Africa

Preamble

The growth of AI in East Africa relies on strong digital infrastructure, research capacity, and innovation ecosystems. Reliable connectivity, data systems, and high-performance computing are essential for AI development. Research institutions, universities, and innovation hubs support home-grown solutions to regional challenges. As countries expand digital transformation, collaboration among academia, industry, and government is crucial for advancing AI research and commercialization. Sustainable AI ecosystems require strategic investments, supportive policies, capacity development, and stronger regional partnerships to promote knowledge sharing and innovation-driven growth.



Keynote Presentation: Amine Idriss, Director of Economy, Infrastructure and Trade, AUDA-NEPAD

Title of Presentation: Building Regional AI Infrastructure and Research Capacity in Africa

Session Moderator: Sonia Bagumako, Regional AI Advisor

Session Rapporteur: Prof. Charles Karuku Gachuiiri

Panelists:

- Nicholas Mponimba, CEO, RENU Uganda
- Prof. Madara Ogot, CEO, UbuntuNet Alliance
- Victor Muvunyi Senior, Technologist MINICT Rwanda
- Didier Nkurikiyimfura, Director, Emerging Technologies & AI, Smart Africa

Keynote Presentation

Amine Idriss emphasized that data centres, high-performance computing, and AI constitute a single integrated value chain essential for Africa's digital future. He noted that while East Africa is gaining momentum, the continent remains far from compute sovereignty due to fragmented capacity, despite rising demand projections for 2030.

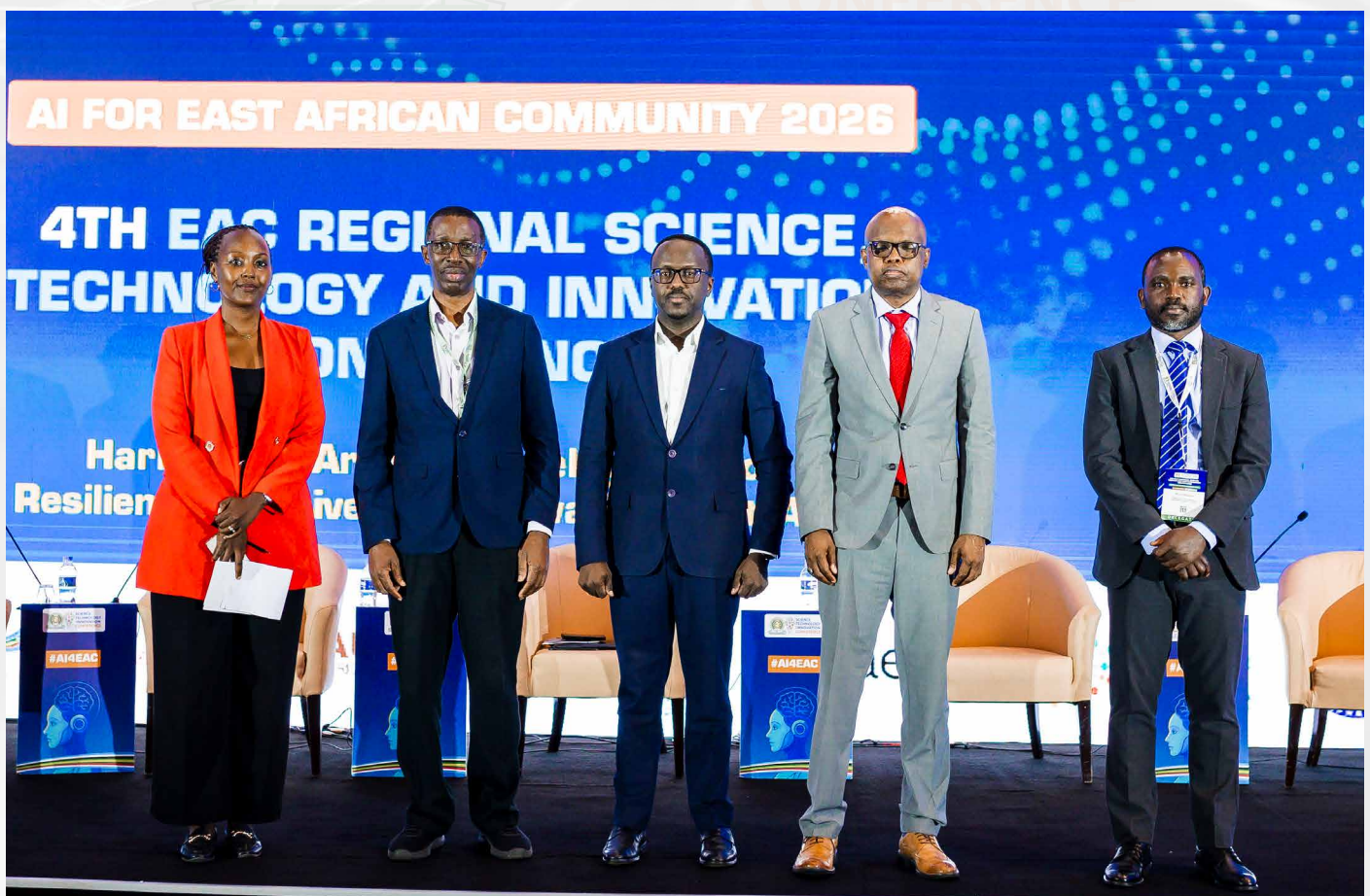
Idriss urged African nations to treat compute as core infrastructure, create local anchor demand through government procurement, and attract private capital. At the regional level, he called for the EAC to harmonize investment rules, build partnerships with the private sector, and establish a Digital Infrastructure Trust Fund. Concluding, he affirmed that AUDA-NEPAD aims to transform these strategies into investable platforms and bankable projects to achieve African AI sovereignty.

Panel Discussion

The discussion underscored that the development and adoption of AI in Africa, and particularly within the East African Community (EAC), is fundamentally driven by three interlinked pillars: infrastructure, research, and innovation. Participants noted that while AI is increasingly recognised as a transformative force, the region's progress is constrained by significant gaps in enabling infrastructure—especially in data and computational capacity. Africa currently has an estimated 0.4GW of data centre capacity, yet demand is projected to rise sharply to between 1.5 and 2.2GW by 2030, highlighting the scale of investment required.

A key recommendation was that AI should be treated as a strategic industrial priority rather than a niche technological concern. This would help stimulate demand, attract private capital, and ensure that governments prioritise enabling policy environments. Within the EAC context, there was a strong call to harmonise AI investment regulations across member states, establish a regional partnership platform, and create a dedicated digital infrastructure trust fund to support infrastructure, research, and innovation.

The discussion also stressed the importance of aligning strategy with execution by leveraging existing continental initiatives such as PIDA PAP2 and AUDA-NEPAD, rather than building parallel systems. However, several structural challenges were identified, including limited human capacity and AI literacy, inadequate investment in both people and infrastructure, a shortage of data centres, weak connectivity, inconsistent policy implementation, and overall underinvestment.



KEY POINTS AND EMERGING ISSUES

The proposed way forward emphasised a coordinated, multi-pronged approach: developing large shared data centres and regional computing infrastructure; strengthening connectivity across EAC countries to enable seamless data exchange; improving power availability as a critical enabler of AI systems; and establishing dedicated education and research networks. Existing platforms such as KENET in Kenya were highlighted as models for expanding research connectivity. Additionally, participants called for greater investment in talent development, improved data collection and quality, supportive policies for affordable 4G/5G access, and stronger regional collaboration to make AI both scalable and inclusive.

The session recommended a coordinated approach focused on strengthening both people and systems to accelerate AI development across the East African Community (EAC). A central priority is investment in human capacity development to ensure that countries build a strong pipeline of AI skills, from basic literacy to advanced research expertise. This should be matched by substantial investment in digital infrastructure, particularly in computing power and connectivity, to provide the foundation required for AI development and deployment.

Participants also emphasised the importance of harmonising AI-related policies across EAC member states to create a more predictable and enabling regional environment for investment, innovation, and cross-border collaboration. Closely linked to this was the need to promote structured data sharing among EAC countries, enabling more efficient use of resources and strengthening regional AI ecosystems.

Finally, the session stressed inclusivity as a guiding principle, urging that no country within the EAC should be left behind. This requires balanced investment in both human capacity and infrastructure across all member states to ensure equitable participation in and benefits from the region's emerging AI economy.



PLENARY SESSION 3

Building a Skilled AI Workforce for the East African Community

Preamble

Building a skilled AI workforce is critical for the EAC to harness emerging technologies for sustainable development, economic growth, and regional competitiveness. As AI transforms industries, governance, and society, the region faces both opportunities and skill gaps that must be addressed strategically. Developing local talent through targeted education, training, and research initiatives will enable EAC member states to lead AI innovation, drive digital transformation, and ensure inclusive participation in the Fourth Industrial Revolution.

Keynote Presenters



Ben Ruhinda,
Senior Systems Officer,
IUCEA



Jaume Fortuny, Senior
Project Manager, OBREAL

Title of Presentation: Empowering the Human Edge: Building a Future Ready Workforce in Age of AI

Title of Presentation: University-led AI incubators for inclusive regional development

Session Moderator: Brenda Nakazibwe, Team Leader Pathogen Economy, STI Secretariat, Office of the President

Session Rapporteur: Dr. Japhet Niyobuhungiro

Panelists:

- Dorothee Weyler, Director, Regional Office for Africa, DAAD (absent)
- Charles Wanyonyi, UNESCO, Education, Campus Africa
- Dr. Houssein Ahmed Assowe, Director, Mathematics & Numerical Research Centre, University of Djibouti

Keynote Presentation: Ben Ruhinda

In his keynote address, Ben Ruhinda highlighted the critical role of research and education networks in advancing knowledge sharing across Africa and globally. He emphasized that strong digital research infrastructure is essential for enabling collaboration, innovation, and equitable access to knowledge in higher education systems.

A central theme of his presentation was the importance of the “human edge” in the age of AI. He argued that while AI will transform many aspects of work and learning, it will not replace humans; instead, the future will belong to individuals who can effectively combine AI tools with uniquely human capabilities such as creativity, critical thinking, and ethical reasoning.

Reflecting on IUCEA’s 2023 annual meeting, he noted persistent challenges in higher education, including fragmented systems across institutions, limited readiness for AI integration, and weak

data ecosystems. In response, IUCEA has been advancing initiatives such as data management guidelines, interoperability frameworks for institutional systems, and the development of AI-ready datasets, alongside capacity-building programmes for academics.

He further outlined plans to establish a Regional Centre of Excellence in AI Education and Research, envisioned as a federated network of universities to strengthen regional collaboration and expertise. His strategic roadmap for the future included foundational AI learning modules, policy frameworks, benchmarking standards, curriculum transformation, and digital inclusion efforts.

For the East African Community's AI agenda, he proposed innovative mechanisms such as a Data Trust Corridor, a Digital Innovation Passport, and systems for recognising virtual assets. Throughout his address, he stressed that successful AI transformation will depend on strong partnerships, noting that no single institution can achieve this agenda alone. He concluded by highlighting the importance of shared learning through AI innovation challenges to accelerate regional progress.

Keynote Presentation: Jaume Fortuny

In his keynote presentation, Jaume Fortuny highlighted the potential of university-led AI incubators as a powerful model for inclusive regional development in Africa, particularly within the East African Community (EAC). He emphasized that universities are not only centres of learning but can also serve as active agents of socioeconomic transformation when properly supported to foster innovation, entrepreneurship, and applied research.

He showcased successful case studies from Kenya to illustrate this approach, including projects focused on empowering marginalised ethnic communities, using AI to bridge language barriers ("AI254: Language as a gateway, not a barrier"), and designing AI solutions for vulnerable populations. These examples demonstrated how university-based incubators can effectively nurture local talent and translate ideas into impactful, community-driven innovations, making a strong case for scaling this model across the region.

Fortuny argued that Africa already possesses the key ingredients for an AI-driven transformation—talent, universities, and urgency—but lacks the enabling "bridge" to connect these assets. He identified AI incubators as that bridge, combining university talent with AI and multilingual innovation, supported by seed funding, mentorship, and international partnerships.

A strong emphasis was placed on multilingualism as a driver of inclusion, cultural preservation, and decolonisation, ensuring that AI systems serve diverse communities and local realities. The incubator model also prioritises local ownership, scalability, and the development of transversal skills, positioning it as a workforce engine capable of preparing young people for the future AI economy.

He concluded by calling on the EAC to embrace this model, noting OBREAL's willingness to collaborate with universities and announcing upcoming opportunities for engagement through a new call for partnerships.

Panelist Discussion

Charles Wanyonyi of UNESCO highlighted the organisation's ongoing work with governments and other partners in developing AI competency frameworks for educators, aimed at strengthening the capacity of teachers to effectively integrate AI into teaching and learning. He emphasised the urgency of curriculum reform and the need for continuous professional development for educators, particularly within universities, to ensure that education systems remain aligned with rapidly evolving labour market demands.

He further underscored the importance of robust skills intelligence systems to guide education and training reforms. In this regard, he referenced initiatives such as a global skills tracker, designed to map skills supply and demand dynamics across countries, and a “skills-to-careers compass,” a mobile-enabled tool intended to help learners navigate pathways from education into employment. Together, these tools were presented as part of a broader effort to make education systems more responsive, data-driven, and better connected to real-world economic opportunities.

Dr. Houssein Ahmed Assowe of the University of Djibouti shared practical insights on what it takes to build AI research capacity in resource-constrained settings, drawing on experiences from the Horn of Africa, including Somalia and Djibouti. He described efforts to develop AI research ecosystems in these contexts, including work on natural language processing (NLP) and collaboration with international partners to strengthen local capabilities.

He highlighted significant challenges faced in establishing sustainable AI research facilities, particularly limited infrastructure, inadequate funding, and difficulties in retaining skilled talent within the region. These constraints, he noted, continue to slow the development of robust AI research ecosystems in many parts of the Horn of Africa.

To address these challenges, he recommended a strategic focus on strengthening foundational STEM education as a long-term enabler of AI capacity. He also emphasised the importance of deepening regional research collaboration to pool resources, share expertise, and build more resilient and interconnected AI research networks across countries facing similar structural constraints.

The panel discussion underscored the critical need to better align education systems with rapidly evolving labour market demands, particularly through the use of skills intelligence tools and competency frameworks. Initiatives such as UNESCO's global skills tracker and the Skills to Careers Compass were highlighted as important mechanisms for improving visibility of skills gaps and guiding learners more effectively into employment pathways.

There was strong agreement among panellists on the importance of strengthening public-private partnerships to drive innovation, support research ecosystems, and accelerate talent development across the region. Such collaborations were seen as essential for bridging resource gaps and ensuring that AI development is both sustainable and industry-relevant.

A key concern raised was the persistent challenge of brain drain, with many skilled AI professionals leaving the region in search of better opportunities abroad. This was linked to limited local

opportunities, as well as rigid procurement systems that often disadvantage local innovators. Participants discussed the need to address these structural barriers by creating more supportive environments for homegrown solutions and reforming procurement processes to enable greater participation of local talent and enterprises.

Overall, the discussion emphasised the importance of co-creation and contextual adaptation of AI solutions, rather than reliance on imported models that may not reflect local realities. In this regard, universities were repeatedly highlighted as critical development agents, with a mandate not only to educate but also to actively contribute to innovation, problem-solving, and socioeconomic transformation within their societies.

KEY POINTS AND EMERGING ISSUES

The session highlighted a set of interconnected priorities aimed at strengthening the East African Community's (EAC) AI ecosystem through education reform, institutional collaboration, and talent development. A key recommendation was for universities to revise curricula to incorporate problem-based learning approaches and better align academic programmes with emerging AI skill requirements. Participants also called for the establishment and strengthening of regional AI research hubs and innovation ecosystems to support applied research and collaboration.

There was strong emphasis on the importance of public-private partnerships in driving AI talent development and innovation. These partnerships were seen as essential for providing seed funding, mentorship, and practical support for student-led AI projects, with a particular focus on solutions that address local challenges and promote multilingual inclusion.

A major concern raised was the risk of brain drain, with calls for deliberate strategies to retain AI talent within the region. These included creating incentives for innovation, expanding funding opportunities, and reforming procurement frameworks to enable the adoption and scaling of homegrown AI solutions. Participants stressed that valuing local innovation and removing rigid procurement barriers are critical to retaining skilled professionals and fostering a vibrant AI ecosystem.

The discussion also underscored the importance of strengthening collaboration among EAC institutions to co-create AI solutions that are tailored to local contexts rather than imported models. In addition, participants recommended the development of a regional AI workforce strategy for the EAC, supported by centres of excellence and university-based AI incubators across Partner States.

Finally, the need to support regional mobility and establish mutual recognition of AI-related qualifications within the EAC was highlighted as a key enabler for building a more integrated and dynamic regional AI labour market.



PLENARY SESSION 4

Ethics and Responsible AI in the East African Community

Preamble

AI is transforming societies and economies across the EAC. Ensuring its responsible development is critical to protect human rights, promote equity, and build public trust. Ethical AI—based on transparency, fairness, accountability, privacy, and inclusivity—prevents bias and harm. For the EAC, embedding these principles is both a moral duty and a strategic opportunity, requiring collaboration among governments, academia, industry, and civil society to establish governance frameworks, guidelines, and awareness programs that drive sustainable, inclusive, and competitive AI innovation.



Keynote Presentation: Bill Faruki, Founder & CEO, MindHyve.ai
Title of Presentation: Human-Centred and Ethical AI for East Africa

Session Moderator: Hugue Ngandeu Ngatta, Head of Unit for Social and Human Science, UNESCO

Session Rapporteur: Dr. Didacienne Mukanyiligira

Panelists:

- Prof. Damien Hanyurwimfura, Lead, Centre of Excellence for IoT, University of Rwanda
- Dr. Joyce Nakatumba-Nabende, Head of AI Lab, Makerere University
- Malcolm Kijirah (CELA), Government Affairs Manager, Kenya, Microsoft
- Teddy Nalubega, Founding Managing Director, Ubuntu Centre for AI Governance and Innovation
- Karim Attoumani Mohamed, Expert, Digital Governance, Telecommunications Regulation & Ethics of AI, Comoros

Keynote Presentation

In his keynote address, Bill Faruki delivered a strong call for the region to take ownership of how AI is designed, deployed, and governed. He framed the central challenge of AI not as a purely technical issue, but as one of power and accountability—questioning who is responsible when AI systems make consequential errors in sectors such as healthcare, education, and justice. His argument was that, in many current deployments globally, accountability is often unclear, and this disproportionately affects communities outside the major technology-producing regions.

A key theme of the presentation was the risk of “data colonialism,” where valuable data generated in African institutions is extracted and used to train external AI systems that capture the resulting value. Faruki stressed that East Africa is in a uniquely advantageous position: unlike more mature markets, it has not yet locked itself into entrenched AI systems and therefore has the opportunity to define its own governance standards. Drawing a parallel with Kenya’s mobile money success, he argued that the region can lead globally by building context-specific, responsible AI frameworks from the outset.

He outlined three non-negotiable requirements for human-centred AI: explainability (users must understand the reasoning behind AI outputs), non-exploitation (local data should not be used to train external models without clear benefit), and accountability (systems must provide full audit trails for decisions). These, he emphasised, are not abstract principles but concrete engineering requirements that institutions should demand from vendors.

Faruki positioned universities and public institutions as critical actors in setting these standards, particularly through procurement decisions. He concluded with a practical framework of three questions institutions should ask any AI provider: whether outputs are explainable, whether local data is used in training, and whether decisions are fully auditable. Ultimately, his message was that East Africa has both the leverage and the responsibility to shape a global standard for ethical, human-centred AI—provided it acts decisively before current systems and contracts become entrenched.

Panel Discussion

The panel brought together diverse perspectives on ethical and responsible AI in the East African context, with each panellist highlighting specific priorities and challenges.

Dr. Joyce Nakatumba-Nabende of Makerere University underscored the importance of ensuring that AI systems are grounded in local realities. She emphasised that for AI to be truly effective and equitable, it must reflect local languages, cultural contexts, and societal values, rather than relying on externally developed models that may not align with regional needs.

Prof. Damien Hanyurwimfura of the University of Rwanda focused on the challenges of translating AI research into practical and commercial applications. He pointed to limited funding and weak linkages between academia and industry as key barriers to AI commercialization. He also stressed the importance of designing ethical AI systems that are built using African data and contextualised for African environments.

Malcolm Kijirah of Microsoft Kenya addressed the critical issue of data governance, clarifying distinctions between data localization, data residency, and data sovereignty. He advocated for stronger regional collaboration and the development of innovative, forward-looking policy frameworks to ensure that data is managed in ways that support both innovation and national interests.

Teddy Nalubega of the Ubuntu Centre for AI Governance and Innovation highlighted the need for inclusive AI development, with particular attention to linguistic diversity and the inclusion of marginalized communities. She also warned of the risks of bias in AI systems and called for the adoption of broader evaluation metrics that go beyond technical accuracy to consider fairness and societal impact.

Karim Attoumani Mohamed from Comoros brought attention to the unique challenges faced by small island states in preparing for AI adoption. He referenced UNESCO frameworks for assessing AI readiness and guiding governance, noting their value in helping countries with limited resources develop structured and context-appropriate AI strategies.

The panel discussions centred on a range of critical governance, policy, and strategic issues shaping the development of AI in the region. A key concern was the question of legal accountability, with panellists debating who should bear responsibility when AI systems cause harm—whether developers, deployers, or institutions using the technology. Closely linked to this was the role of governments in safeguarding citizens’ rights, particularly in ensuring data privacy and protection in an increasingly AI-driven environment.

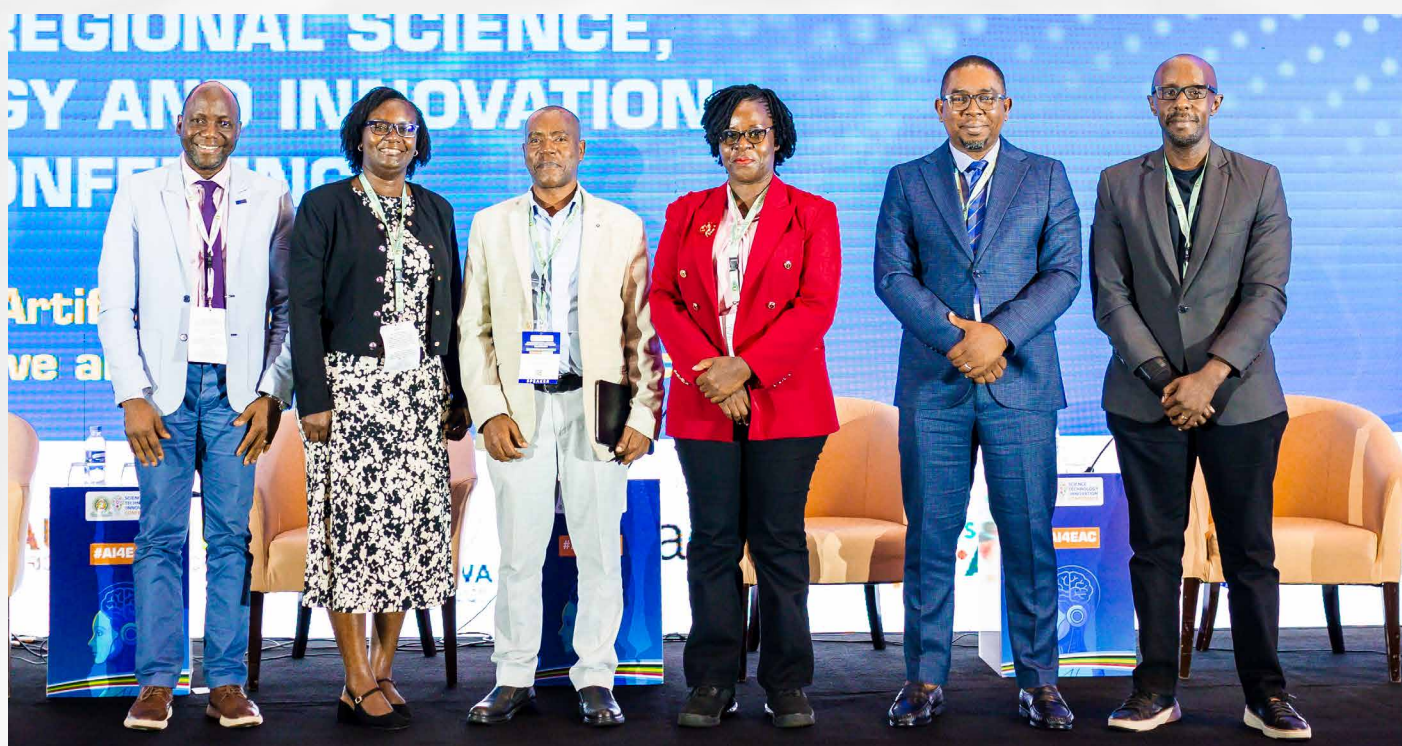
Panellists also engaged in a strategic debate on investment priorities, weighing the merits of heavy investment in AI infrastructure against a more pragmatic focus on leveraging existing tools for immediate impact. This reflected broader questions about resource allocation and readiness across different countries in the region.

Another important issue raised was how to balance data sovereignty with participation in global AI ecosystems. While there was recognition of the need to protect national and regional data assets, panellists also acknowledged the importance of remaining connected to global innovation networks and avoiding isolation.

There was strong consensus on the value of regional cooperation, particularly in developing shared data infrastructure and harmonised policy frameworks. Collaboration was seen as essential for pooling resources, strengthening bargaining power, and ensuring more coherent AI development across countries.

The discussions also highlighted the growing risks associated with AI, including deepfakes and misinformation, and the urgent need for public awareness, digital literacy, and targeted training to help societies respond effectively to these challenges.

Overall, panellists agreed that addressing these complex issues requires a multi-stakeholder approach, bringing together governments, academia, the private sector, and communities to co-create inclusive, responsible, and contextually relevant AI systems.



KEY POINTS AND EMERGING ISSUES

The panel's recommendations reflect a shift from broad principles toward more practical, system-level approaches to governing AI in the region. At the core is the recognition that AI risks are not uniform, and therefore require tiered risk assessment frameworks that match the level of oversight to the potential impact of different applications. Such frameworks should be supported by mandatory transparency and audit mechanisms, particularly in high-stakes sectors like healthcare, education, and justice, where the consequences of failure are significant. Closely tied to this is the need for clear accountability structures, ensuring that responsibility for AI-driven decisions is well defined and enforceable.

At the same time, the panel stressed that governance cannot succeed without strong human capacity. Prioritising AI literacy—across policymakers, practitioners, and the broader public—alongside specialised training, including for emerging roles such as inference engineers, is essential to building a workforce capable of both deploying and scrutinising AI systems effectively.

From a regional perspective, collaboration emerged as a critical enabler. Panellists advocated for joint development of data infrastructure and harmonised governance frameworks across countries, alongside more nuanced data policies that emphasise classification and responsible use rather than rigid localisation. This approach would allow countries to safeguard sovereignty while still participating in global AI ecosystems.

Ethics and inclusivity were positioned as cross-cutting imperatives, requiring deliberate integration into every stage of AI development and deployment. This includes ensuring that marginalised groups are actively involved in shaping AI policies and that systems are designed to reflect diverse contexts and needs. Strengthening linkages between academia and industry was also highlighted as key to translating research into real-world innovation and commercial opportunities.

Finally, the panel called for alignment with established international frameworks, such as UNESCO's AI ethics recommendations, while emphasising the importance of continuous policy review and evidence-based decision-making. In a rapidly evolving technological landscape, adaptive governance—grounded in data, experience, and ongoing stakeholder engagement—was seen as essential to ensuring that AI development remains both responsible and responsive to societal needs.

DAY TWO

The second day of the conference saw myriad activities, with three different sets of activities. The fifth Plenary Session of the conference tackled the theme, “The Role of Open Science and Diplomacy in Global and Regional AI Advancement.” The keynote presentation, panellists’ session and plenary discussions delved into the place of open science in Artificial Intelligence and the central role of open science in shaping a responsible, inclusive, and globally competitive AI ecosystem in Africa.

Four side events were also held on the second day of the conference. These included an articulation of a Vision for Open Research in Africa; the First East African Digital Leaders Forum on Artificial Intelligence; a discussion on Leveraging Responsible AI for Climate Resilience in Africa; and an Editorial Board Meeting of the East African Journal of Science, Technology and Innovation. Nine Parallel Sessions were also held. Each of these parallel sessions saw presentations and discussions of between four and six papers touching on specific areas of recent scientific research on the influence of AI in technology and innovation.

PLENARY SESSION 5

The Role of Open Science and Diplomacy in Global and Regional AI Advancement

Preamble

AI is rapidly reshaping economies, governance, and scientific discovery worldwide. Maximizing its benefits requires collaborative approaches that transcend national and institutional boundaries. Open science promotes transparency, shared knowledge, and inclusive innovation, while science diplomacy strengthens international partnerships and trust. Together, they create pathways for equitable access to AI technologies and responsible development. This theme highlights the importance of global cooperation in advancing ethical, accessible, and impactful AI solutions that address shared societal challenges and drive sustainable development across regions and nations.



Keynote Presentation: Joy Owango, Executive Director, Training Centre in Communication (TCC Africa)

Title of Presentation: Advancing Responsible AI Through Open Science and Science Diplomacy: Connecting Partner States for Inclusive Regional Innovation

Session Moderator: Nicole Mulaku, Programme Officer, TCC Africa

Session Rapporteur: Diana Umulisa

Panelists:

- Dr. Henry Waruhiu, Director, Research and Management, ESAMI
- Christian Kohl, Director of Technology and Engineering, Public Library of Science, PLOS

Keynote Presentation

In her keynote address, Dr. Joy Owango of the Training Centre in Communication (TCC Africa) highlighted the central role of open science in shaping a responsible, inclusive, and globally competitive AI ecosystem in Africa. She argued that open science principles—such as transparency, accessibility, and collaboration—are essential for ensuring that AI development benefits a broad range of stakeholders and does not reinforce existing inequalities.

A key conceptual contribution of her presentation was the “singularity paradox,” which underscored the need to keep AI systems firmly grounded in human values, ethical oversight, and strong governance frameworks. She cautioned that without these safeguards, rapid technological advancement could outpace society’s ability to manage its consequences responsibly.

Dr. Owango also showcased TCC Africa’s extensive work across more than 40 African countries, focusing on open science advocacy, infrastructure development, and capacity building. She positioned the “triple helix” model—bringing together academia, policymakers, and industry—as a practical framework for building robust AI ecosystems that are both innovative and responsive to societal needs.

Her presentation highlighted several African-led initiatives that are strengthening the continent’s

research and data infrastructure, including the Africa PID Alliance, AfricaArXiv, Africa Connect, and AFRID. These platforms are helping to improve research visibility, collaboration, and data accessibility across the continent. Notably, she pointed to the development of Africa's first Digital Object Identifier (DOI) as a milestone in enhancing the global recognition of African research and enabling the integration of indigenous knowledge into formal knowledge systems. She also introduced the Hospital Integrated Research Management System (ReS), an AI-enabled platform designed to support clinical research in hospitals, improve data management, and enhance global competitiveness in health research.

Overall, Dr. Owango emphasised that for Africa to fully participate in global knowledge systems and AI development, it must invest in machine-readable data, interoperable digital systems, and inclusive research infrastructure. Her address reinforced the idea that open, well-governed data ecosystems are foundational to building ethical, effective, and locally relevant AI solutions.

Panel Discussion

The panel discussion highlighted the growing importance of science diplomacy as a critical tool for addressing the complex and cross-border challenges associated with AI development. Panellists stressed that no single institution or country can effectively govern or advance AI in isolation, and that stronger collaboration across national boundaries, sectors, and disciplines is essential.

There was strong consensus on the need to move toward more coordinated regional efforts, particularly through joint research and development initiatives and the establishment of regional AI laboratories. These efforts should be supported by open data-sharing practices and interoperable research systems, enabling seamless collaboration and more efficient use of resources across countries and institutions.

A key theme throughout the discussion was the need to transition from fragmented, siloed initiatives to more coordinated and polycentric governance structures. Such approaches would allow multiple centres of decision-making while maintaining alignment across the region. At the same time, panellists emphasised the importance of ensuring local ownership of AI technologies to avoid dependency on external vendors, reduce the risk of systemic bias, and retain value within African economies.

Several structural challenges were also raised. These included the limited global visibility of African research, largely due to the absence of standardised identifiers and integration into global knowledge systems. Panellists also called for a shift in how research is evaluated, advocating for greater emphasis on societal impact rather than traditional publication metrics. In this context, aligning policy, research, and diplomacy was seen as essential for building a coherent and effective AI governance framework.

Finally, the discussion underscored the role of publishers and the broader research ecosystem in supporting openness and inclusivity. Panellists called for greater support for open data, open code, and community-driven research infrastructure, as well as ensuring that African stakeholders are meaningfully included in global AI systems and decision-making processes.

KEY POINTS AND EMERGING ISSUES

The session expressed a strong commitment to building a more open, collaborative, and globally integrated African research and AI ecosystem. Central to this vision is the need to strengthen the adoption of open science principles across the continent through coordinated partnerships. By promoting transparency, accessibility, and shared knowledge, these efforts aim to enhance both the quality and impact of research while ensuring that African institutions are active contributors to global knowledge systems.

A key priority identified was the expansion of the Africa PID Alliance and the broader use of African-generated persistent identifiers. This was seen as essential for improving the visibility, traceability, and recognition of African research outputs within global systems, while also supporting better data governance and interoperability.

The session also emphasised the importance of developing robust research management systems, particularly within hospitals, to enable more effective, data-driven research. Such systems would strengthen clinical research capacity, improve data quality, and enhance the region's ability to participate in global health research initiatives.

To address fragmentation and inefficiencies, participants called for the establishment of joint AI research programmes, centres of excellence, and shared infrastructure. These initiatives would promote collaboration, reduce duplication of efforts, and maximise the use of limited resources across countries and institutions. Complementing this, there was a strong push for open, interoperable, and machine-readable data systems to improve research accessibility, usability, and cross-border collaboration.

Science diplomacy was highlighted as a key enabler for aligning regional and global AI governance frameworks, ensuring that African perspectives are represented in international discussions and standards-setting processes. At the same time, the session stressed the importance of supporting locally developed, open-source AI solutions as a way to ensure contextual relevance, reduce dependency on external technologies, and mitigate risks of bias.

Finally, participants called on publishers and research institutions to play a more active role in advancing open access by making research outputs, data, and code widely available and aligned with community needs. This was seen as a critical step toward building a more inclusive, equitable, and impactful research ecosystem across Africa.



PLENARY SESSION 6: SIDE EVENTS

Side Event 1: Advancing STISA 2034 - Vision for Open Research in Africa

Session Overview

This side event focused on advancing an Africa-led vision for open research, aligned with STISA 2034 and Agenda 2063. The session brought together continental, regional, and national stakeholders to examine how open science can strengthen research systems, enhance collaboration, and support Africa's knowledge sovereignty. Discussions were structured across technical presentations, keynote insights, panel dialogue, and interactive consultations. Key outcomes emphasized the need to bridge the gap between policy frameworks and implementation, strengthen infrastructure and capacity, and promote coordinated, African-led approaches to open research. The session concluded with a call for collective action to operationalize open research as a driver of innovation and sustainable development in Africa.

Speakers:

1. Dr. Fortunate Muyambi – Deputy Executive Secretary, EASTECO (Opening remarks and strategic framing of Open Research in Africa)
2. Dr. Moses Aloba – Science for Africa Foundation (Context setting: Open research and decolonizing science in Africa)
3. Prof. Brando Okolo – AUDA-NEPAD (Presenter: STISA 2034 and open research ecosystem; Panelist: High-level discussion on continental alignment and indigenous knowledge)
4. Mahlit Tashoma – Principal Policy Officer for Science and Technology, African Union Commission (Keynote Speaker: Open research, data governance, and knowledge sovereignty; Panelist: High-level discussion on policy gaps and implementation challenges; representing Prof. Gaspard Banyankimbona)
5. Dr. Paul Korir – Science for Africa Foundation (Presenter: Scientific computing and research infrastructure in Africa)
6. Allen Mukhwana – Science for Africa Foundation (Presenter: Africa-led vision for open research)
7. Abiodun Egbetokun – Science for Africa Foundation (Presenter: Implementation framework and alignment of open research in Africa)
8. Dr. Judy Omumbo – Science for Africa Foundation (Moderator: High-level panel discussion)
9. Dr. Eugene Mutimura – National Council for Science and Technology (NCST), Rwanda (Panelist: National implementation perspective on open research systems and data sharing)
10. Joy Owango – Training Centre in Communication (TCC Africa) (Panelist: Governance, incentives, and capacity building for open research adoption)

Session Moderator: AUDA-NEPAD and Science for Africa Foundation

Session Rapporteur: Diana Umulisa

Key Presentations:

Dr. Fortunate Muyambi (EASTECO)

Emphasized that open research is essential for Africa's scientific advancement and knowledge sovereignty. Highlighted challenges including fragmented systems, limited infrastructure, and

low visibility of African research, and stressed the need for stronger regional coordination to align national and continental efforts.

Dr. Moses Aloba (Science for Africa Foundation)

Framed open research within the agenda of decolonizing science in Africa. Underscored the importance of open science infrastructure, responsible data governance, and collaborative approaches to AI development aligned with continental priorities.

Prof. Brando Okolo (AUDA-NEPAD)

Outlined Africa's STI progress and emphasized that open research should be viewed as a holistic ecosystem. Highlighted low R&D investment and weak intra-African collaboration, and called for a shift toward African-led co-creation and demonstrating the socio-economic value of research.

Mahlit Tashoma (African Union Commission)

Focused on the central role of data in open research, emphasizing FAIR principles (findable, accessible, interoperable, reusable). Highlighted knowledge sovereignty and the need to address the data divide, noting that openness strengthens Africa's control over its knowledge systems.

Dr. Paul Korir (Science for Africa Foundation)

Presented findings on scientific computing capacity, showing low institutional readiness and high dependence on external systems. Emphasized scientific computing as a foundational pillar of research and called for investment in local capacity and shared infrastructure.

Allen Mukhwana (Science for Africa Foundation)

Presented the vision for an Africa-led open research ecosystem, highlighting fragmentation and weak coordination as key barriers. Emphasized the need for a lifecycle approach to research and stronger continental alignment.

Abiodun Egbetokun (Science for Africa Foundation)

Reinforced the need for alignment between national, regional, and continental efforts in implementing open research. Emphasized the importance of structured coordination, policy coherence, and addressing systemic challenges such as high publishing costs and limited infrastructure.



KEY POINTS AND EMERGING ISSUES

The recommendations from the session reflect a comprehensive effort to align Africa's research, innovation, and AI development agenda with broader continental priorities while addressing structural gaps in capacity, coordination, and ownership. A central theme was the need to strengthen alignment between high-level continental frameworks, such as STISA 2034 and Agenda 2063, and their translation into actionable national strategies. This alignment is essential to ensure coherence, avoid duplication, and maximise the impact of investments across countries.

A major priority identified was the need for sustained investment in scientific computing infrastructure and shared digital systems across African institutions. Such infrastructure would provide the backbone for research, data management, and AI development, enabling collaboration at scale. Alongside this, participants called for the development and harmonisation of open research policies that are tailored to African contexts, ensuring that openness is implemented in ways that reflect local realities and priorities.

Capacity building emerged as another critical pillar, with emphasis on improving digital literacy and technical skills not only for researchers but also for administrators who manage research systems. Complementing this, there was a strong call to reform research incentive and evaluation systems, shifting away from narrow publication-based metrics toward models that reward open science practices, collaboration, and societal impact.

The session also highlighted the importance of strengthening African ownership of research agendas, data, and knowledge systems. This includes promoting African-led research priorities and ensuring that the continent retains control over how its data is generated, managed, and used. In parallel, the integration of indigenous knowledge systems into formal research frameworks was identified as a key step toward building more inclusive and contextually relevant knowledge ecosystems.

To address fragmentation, participants emphasised the need for stronger regional and continental coordination mechanisms that can align efforts across institutions and countries. While international partnerships remain important, the discussion stressed that these should be structured in a way that reinforces African leadership rather than dependency.

Finally, the recommendations underscored the importance of developing sustainable financing models to support open research initiatives over the long term. Without reliable funding, efforts to build open, collaborative, and inclusive research ecosystems risk remaining fragmented and short-lived. Overall, the session called for a balanced approach that combines openness, coordination, capacity building, and local ownership to position Africa as an active and influential player in the global research and AI landscape.



Side Event 2: First East African Digital Leaders Forum on Artificial Intelligence

Session Overview

The session was convened as part of the First East African Digital Leaders Forum on Artificial Intelligence, bringing together EAC Partner States, regional institutions, and development partners to align on a coordinated regional AI agenda. It focused on transitioning from fragmented national AI initiatives toward a harmonized regional strategy and implementation framework. The session was structured around key presentations on governance, the Digital Leaders Forum (DLF), the EAC AI Alliance, the draft regional AI strategy, and shared infrastructure and investment opportunities. Discussions emphasized inclusivity, alignment, and the need for practical implementation mechanisms. A key outcome was the consensus that AI is already shaping economies and must be treated as an immediate development priority requiring coordinated regional action.

Session Moderator: EAC AI Alliance

Session Rapporteur: Dr. Marie Chantal Cyulinyana

Key Presentations:

Session I: Opening and Context Setting

Opening remarks by EASTECO, IUCEA, and GIZ positioned the Forum as a milestone for regional digital transformation. Speakers emphasized that AI is already influencing economies and that regional coordination is essential for impact. Discussions highlighted the importance of addressing misconceptions about AI and ensuring Africa actively shapes its AI future. The introduction of the AI Alliance and governance discussions underscored the need for inclusive participation, strengthened digital skills, mentorship frameworks, and greater involvement of national research institutions.

Session II: Governance Structure and Digital Leaders Forum (DLF)

The DLF was presented as a multi-level governance framework linking national and regional platforms with multi-stakeholder participation. Key discussions focused on clarifying representation, particularly for academia and research institutions; ensuring inclusion of youth and women, and aligning with continental initiatives such as the AU AI Council. Participants stressed the need for clear membership structures, coordination across levels, and avoiding duplication of efforts.

Session III: Draft EAC Regional AI Strategy

The draft AI Strategy received strong support from Partner States, with recognition of its vision for an integrated regional AI ecosystem built on seven strategic pillars. However, participants emphasized the need for robust baseline data, measurable indicators, and clearer implementation and financing mechanisms. There was a strong call to move beyond validation toward active co-creation. Country-specific inputs highlighted priorities such as local language models, governance frameworks, data management, infrastructure, and capacity building. DRC was requested to submit additional written contributions.

Session IV: Regional Collaboration for Shared AI Infrastructure

Discussions explored infrastructure needs, including compute capacity, data centres, energy requirements, and interoperability. Participants emphasized the importance of shared regional infrastructure over fragmented national systems, proposing a hybrid model combining national

and regional investments. The role of energy as a key enabler and the importance of linking infrastructure to real economic use cases (e.g., agriculture, health, logistics) were strongly highlighted.

Session V & VI: Opportunities for Regional AI Collaboration and Investment

Discussions focused on developing bankable, demand-driven AI projects and strengthening regional collaboration. Presentations highlighted that regional projects are more attractive to investors than isolated national initiatives. Key requirements for success include regulatory alignment, strong institutions, and clear ownership structures. Cross-cutting themes included the need for harmonized policies, trust-building, inclusive participation, skills development, and robust data governance frameworks. Participants also emphasized addressing risks such as misinformation and ensuring AI contributes to real economic value creation.

KEY POINTS AND EMERGING ISSUES

The recommendations from the session outline a clear transition from strategy formulation to coordinated regional implementation of AI within the East African Community (EAC). A key immediate priority is the finalisation and validation of the EAC Regional AI Strategy, with a defined timeline leading to its submission to relevant regional bodies. This signals a move toward formal adoption and institutional anchoring of the AI agenda at the highest policy levels.

Strengthening governance structures was identified as essential to ensure effective implementation. This includes clearly defining the membership and roles of platforms such as the Digital Leadership Forum (DLF) and the AI Alliance, with an emphasis on inclusivity—bringing in academia, youth, and the private sector to ensure broad-based ownership and participation.

On the infrastructure front, the session called for the development of shared AI systems, particularly regional data centres and compute capacity. A hybrid model—balancing national investments with regional coordination—was proposed to optimise resources while maintaining sovereignty and accessibility. Complementing this is the need for harmonised data governance frameworks that enable secure and trusted cross-border data sharing, a critical enabler of regional AI ecosystems.

To translate strategy into tangible impact, participants recommended identifying a small number of flagship, bankable regional AI projects that can attract blended financing from public and private sources. These projects should be demand-driven, targeting priority sectors such as agriculture, health, and trade, where AI can deliver clear socioeconomic benefits.

The recommendations also emphasised sustained investment in human capital, including AI skills development, digital literacy, and regional talent pipelines, to ensure that the workforce can both drive and benefit from AI adoption.

Finally, the importance of strong regional collaboration was reiterated, calling for deeper partnerships among governments, academic institutions, private sector actors, and development partners. Such collaboration is critical to aligning efforts, mobilising resources, and ensuring that the region's AI agenda is implemented in a cohesive and impactful manner.



Side Event 3: Leveraging Responsible AI for Climate Resilience in Africa: Policy Readiness, Capacity Building, and Action Pathways

Session Overview

This side event focused on advancing human-centred and ethical AI adoption for climate resilience in Africa, with emphasis on policy readiness, capacity building, and actionable solutions. Led by the Africa Research and Impact Network (ARIN), the session brought together stakeholders from research, policy, and practice to examine gaps in AI skills, institutional frameworks, and implementation. Key discussions highlighted the ARIN fellowship program, mapping of AI initiatives, and barriers such as funding constraints, gender disparities, and limited infrastructure. Participants emphasized the importance of translating research into practical applications, particularly in agriculture and community resilience. The session concluded with strong calls for collaboration, inclusive participation, and integration of indigenous knowledge and ethical foresight in AI development.

Speaker: Humphrey Agevi

Session Moderator: EAC AI Alliance

Session Rapporteur: Dr. Marie Chantal Cyulinyana

Key Presentations:

Session 1: Opening and Context Setting

The presenter introduced ARIN as a pan-African think tank operating in 36 countries, focusing on evidence generation and policy influence. He presented the “AI for Climate Resilience” project, emphasizing Africa’s vulnerability to climate change despite low emissions and the need for AI-driven adaptive solutions.

Session 2: Policy and Regulatory Readiness

The presentation highlighted emerging AI strategies across Africa, including efforts in countries like Kenya and Egypt. However, gaps remain in policy implementation, infrastructure, and institutional readiness. Participants stressed the importance of integrating AI into national climate adaptation plans while avoiding over-regulation that could hinder innovation.

Session 3: Capacity Building for Responsible AI

Findings from ARIN’s scoping and capacity assessment revealed limited AI programs, skills shortages, gender disparities, and weak institutional support. The ARIN AI Fellowship program was presented, with 379 applicants and 100 selected fellows. Discussions emphasized the need for inclusive training, mentorship, and practical learning approaches.

Session 4: Applied AI for Anticipatory Action and Humanitarian Resilience

Discussions focused on translating AI research into practical applications, particularly in agriculture and community resilience (e.g., market price prediction tools). Participants emphasized engaging telecom companies for providing data and infrastructure, and ensuring solutions are accessible to non-academic users and local communities.

Session 5: Way Forward and Action Pathways

Participants identified key priorities including strengthening partnerships, promoting innovation hubs, protecting intellectual property, and integrating indigenous knowledge into AI systems.

Ethical foresight, gender inclusion, and community engagement were highlighted as critical for sustainable AI adoption.

KEY POINTS AND EMERGING ISSUES

The recommendations from the session emphasise the importance of strengthening awareness, inclusivity, and practical support mechanisms to deepen participation in the region's AI and research ecosystem. A key priority is for the Africa Research and Impact Network (ARIN) to expand its visibility across all East African Community (EAC) countries and provide clearer guidance on how individuals and institutions can engage—particularly through fellowship programmes and alliance membership. This is intended to broaden participation and ensure that opportunities are accessible to a wider range of stakeholders.

Participants also highlighted the need to strengthen innovation ecosystems by ensuring that organised competitions are supported by robust intellectual property protection frameworks. This would help safeguard ideas, encourage participation, and build confidence among innovators. At the same time, there was a strong call to improve linkages between researchers and policymakers, ensuring that research outputs—especially in AI—are translated into actionable policies and real-world solutions.

Inclusivity was a major theme, with recommendations to increase targeted outreach to women and other underrepresented groups in order to address existing disparities in access to research funding and opportunities. Complementing this, the development of community-level innovation hubs was proposed as a way to support grassroots innovators, foster local solutions, and integrate indigenous knowledge systems into broader innovation processes.

The session also emphasised the strategic role of the private sector, particularly telecommunications companies, in providing the data, infrastructure, and connectivity needed to scale AI solutions. In parallel, there was a call to embed ethical foresight and responsible AI principles into both academic curricula and project design, ensuring that innovation is guided by strong ethical considerations from the outset.

Finally, participants stressed the need to mobilise resources and expand partnerships to scale AI-driven climate resilience initiatives. This reflects a growing recognition of AI's potential to address pressing environmental challenges, provided that sufficient investment and collaboration are in place to support implementation at scale.



Side Event 4: East African Journal of Science, Technology and Innovation (EAJSTI) Editorial Board Meeting

Session Overview

This section indicates a summary of the EAJSTI 's breakaway room's purpose, structure and overall outcomes. The 7th Annual General Meeting of the Editorial Board is aimed at discussing the progress of the journal in view of emerging issues on journal editorial policy, journal quality and induction of new members of the Editorial Board.

The objectives of the Annual General Meeting are:

1. To receive and discuss the progress report of the journal since the 06th AGM;
2. To consider Policy issues
3. To approve the Workplan and Budget for the Editorial Board of the EAJSTI for Financial Year 2025-2026 (revised) and 2026-2027
4. To induct new members of the journal's Executive Committee regarding the operation of the Open Journal Systems (OJS)

Expected Output

1. Progress report received and discussed
2. Policy issues considered
3. Approved Workplan and Budget for the Editorial Board of the EAJSTI for Financial Year 2025-2026 (revised) and 2026-2027
4. Efficient operation of OJS

Session Moderator: EAJSTI Editorial Board

Session Rapporteur: Prof. Annabella Habinka Basaza-Ejiri

Agenda:

1.0 Opening Remarks

The Chairman Prof. Esron Kamuribo welcomed the members of the EAJSTI to the Annual General meeting.

2.0 EAJSTI Progress Update

Presentation on the progress and achievements of the Journal since the last Annual General Meeting.

The EAJSTI was launched in April 2019, the journal has released 32 issues across 7 volumes, including 25 ordinary issues and 7 special issues featuring conference proceedings from various regional science and technology events. The special issues include:

- a. Conference Proceedings from HORTI-GREEN Project from the University of Nairobi: 2 issues;
- b. Conference Proceedings from Science, Technology, and Innovation Conference and Exhibition (STICE) of the Tanzania Commission for Science and Technology (COSTECH): 2 issues;
- c. Conference Proceedings from the 2nd STI Conference organized by EASTECO;
- d. Conference Proceedings of Establishing and Harmonizing Sanitary and Phytosanitary Regulatory Regimes Across the Eight Regional Economic Communities of the African Union, a Scientific Exchange Fellowship hosted by Mississippi State University.
- e. Conference Proceedings from University of Dodoma First International Conference in Science,

1. Performance of the journal between June 2025 and March 2026

A total of 42 articles (16 articles in 3 Ordinary Issues and 26 articles in 1 Special Issue) have been published in the last one year.

2. Editorial activity between June 2025 and February 2026

- a. Submissions received: A total of 265 manuscripts have been submitted during that period, including resubmissions of some manuscripts.
- b. Days to first editorial Decision: The number of days it takes for most submissions to receive the first editorial decision, such as desk rejection or send for review are a bit long. This needs to be addressed by more engagement from reviewers and staffing EASTECO. Induction of the new members of the Editorial Board is a must.
- c. Acceptance rate: The rate of 14% reflects the rigour of the journal and therefore adherence to quality journal.

Recommendations: There is a need to expedite the review process to minimize delays in communicating decisions. However, understaffing within the journal poses a significant challenge that must be addressed. Regular follow-ups and reminders to reviewers and associate editors can help improve the process. Additionally, it is important to induct new Editorial Board members on the operation of the OJS platform. This approach may also lead to an increase in both the quantity and quality of submissions, thereby attracting a larger audience.

3. Progress on Journal Indexing in international databases

To improve the EAJSTI global quality standing, the journal can adopt a combination of strategic, editorial, and operational enhancements. Below are some key recommendations for consideration by the Board:

- i. Strengthen Peer Review Standards for maintaining scientific integrity and attracting high-quality submissions.
- ii. Enhance Indexing and Visibility
- iii. Attract High-Impact Submissions
- iv. Improve Editorial Board Diversity and Expertise
- v. Invest in Digital Infrastructure
- vi. Promote Open Access and Research Integrity
- vii. Engage in Strategic Marketing and Partnerships

3.0 Policy Discussion and Strategic Direction

The following 10 Key policy issues were presented and discussed:

1. Editorial Policy
2. Intellectual Property Rights (IPR) and Copyright Policies
3. Open Access and Publication Policies
4. Ethical challenges on use of Artificial Intelligence
5. Capacity Building and Human Resource Policies
6. Language and Accessibility Policies

7. Motivation of reviewers and Editorial Board Members
8. Publication fees Policy
9. Funds mobilization
10. Use of Journal Platform for STI Knowledge Management and Knowledge sharing

4.0 Editorial Board Workplan and Budget

Presentation and discussion of the Editorial Board workplan and budget for the upcoming financial periods.

5.0 Inauguration of New Editorial Board Members & OJS Orientation

Introduction of new members and briefing on the operation of the Open Journal Systems (OJS). This was postponed to the next online session.



PARALLEL SESSIONS: PAPER PRESENTATIONS

Preamble

Nine Parallel Sessions were held: 1A, 1B, 1C, 2D, 2E, 2F, 3G, 3H and 3I, each with four to six papers lined up. The papers presented gave detailed case studies indicating the background of the study, the problem, the methodology utilized, research findings, and recommendations.

Parallel Session 1A – AI for Agriculture & Food Security

Session Moderator: Prof. Eron Daniel Karimuribo

Session Rapporteur: Prof. Charles Karuku Gachuiiri

Presentations:

1. Optimizing Seed Crop Selection for Variable Climates: An AI-Based Approach to Enhancing Agricultural Productivity using Vertical Farming by Geoffrey Dan Odokonyero.
2. An AI-Driven Solar Energy Monitoring System for Energy-Efficient Operation of Milk Storage Chillers by Emmanuel Ndayisenga.
3. Computational annotations of antennal genes in tsetse flies by Dr Paul O. Mireji.
4. Precision Livestock Farming (PLF) Technologies Evaluation for Smallholder Farming in Africa: A Case Study of Tanzania by Gladness Mwanga
5. A GEOAI-based smart seed zone recommender system for climate-resilient agriculture in East Africa by Charlyne Jepkosge



Optimizing Seed Crop Selection for Variable Climates: An AI-Based Approach to Enhancing Agricultural Productivity using Vertical Farming

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Abstract

Climate variability poses a significant threat to consistent crop production, particularly in regions like East Africa experiencing shifting seasonal patterns. This study addresses this challenge by developing an AI-driven decision-support system designed to optimize seed selection for vertical hydroponic farms, creating a climate-resilient pathway for urban and peri-urban agriculture. The system employs an ensemble machine learning model, integrating Random Forest and Gradient Boosting algorithms, to analyse multi-dimensional data inputs. These include projected climate data (temperature, precipitation anomalies), genetic trait databases of seed varieties (drought tolerance, heat units, photoperiod sensitivity), and vertical farming operational parameters (light spectra, nutrient formulas, controlled environment metrics). The model outputs a dynamic

recommendation of the most suitable, high-yielding seed varieties for specific vertical farm setups under forecasted climate conditions.

An 18-month pilot implementation was conducted across three vertical farming units in Uganda, focusing on leafy greens and seed crops. Results demonstrated a 31% average increase in productivity and a 40% reduction in resource waste (water, nutrients) compared to static seed selection. Regarding scalability, the modular architecture of the AI framework allows for integration of additional crop types and geographical regions, while the cloud-based platform supports expansion from individual units to larger commercial farm networks. This research provides a scalable AI framework that empowers vertical farmers to make proactive, data-driven decisions, thereby enhancing agricultural productivity, ensuring year-round supply, and strengthening climate resilience in urban food systems.

Keywords: Climate-Resilient Agriculture, Seed Selection Optimization, Vertical Farming, Decision Support System, Precision Agriculture



An AI-Driven Solar Energy Monitoring System for Energy-Efficient Operation of Milk Storage Chillers

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Abstract

Ensuring the reliable and efficient operation of milk storage chillers powered by solar photovoltaic (PV) systems necessitates proactive energy management and preventive maintenance. This study introduced an AI-enabled edge computing framework built on an ESP32-based device to facilitate real-time monitoring of PV modules, inverters, and batteries, while enabling hybrid operational optimization. The system captures PV voltage, current, and power metrics under varying load conditions, and employs an Isolation Forest model trained on historical PV and load data to establish baseline operational patterns. The model is continuously refined to adapt to diverse output power levels, thereby supporting dynamic anomaly detection without compromising fail-safe decision-making. By integrating inverter operating point optimization and battery state-of-health (SOH) monitoring, the framework provides AI-generated recommendations for safe corrective actions, allowing operators to perform remote hybrid control during maintenance or power dropouts while avoiding significant loss of stored milk quality or system degradation.

Critical decisions are processed locally at the edge to guarantee resilience, while aggregated and fine-tuned data are periodically synchronized to the cloud for historical analysis and performance tracking. Isolation Forest is used as a first-stage unsupervised anomaly detector, with load-gated inference and temporal constraints used to differentiate transient shading deviations from persistent system faults. Experimental results show a fault detection accuracy of 93.4%, while maintaining a shading-induced false alarm rate below 9%, representing a 35% reduction compared to conventional threshold-based methods. Experimental validation demonstrates effective fault prevention, reduced false alarms through load-gated inference, and improved energy utilization. The proposed system exemplifies the integration of low-power edge intelligence, adaptive AI analytics, and human-in-the-loop control, offering a scalable, energy-efficient, and reliable solution for solar-powered dairy operations.

Keywords: Solar PV Monitoring, Edge AI, Isolation Forest, Predictive Maintenance, Inverter C Battery Optimization.



Computational annotations of antennal genes in tsetse flies

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Abstract

Tsetse flies use antennal expressed genes to navigate their environment. While most canonical genes associated with chemoreception are annotated, potential gaps with important antennal genes have not been uncharacterized in *Glossina morsitans morsitans* (Gmm). We generated antennae-specific transcriptomes from adult male Gmm flies fed/unfed on bloodmeal and exposed to attractant (-nonalactone), repellent (-nonalactone) or respective paraffin odour diluent. Using bioinformatics approach, we mapped raw reads onto Gmm gene-set from VectorBase and collected unmapping reads (constituting the gap in annotation). We de novo assembled these reads into transcript and identified their corresponding transcripts in the Gmm gene-set and homologs in UniProt protein database. We predicted protein-coding gene regions associated with these transcripts in Gmm genome, annotated and curated these genes and identified their putative orthologs/homologs annotated in *Drosophila melanogaster* (Dm), *Musca domestica* (Md) or *Anopheles gambiae* (Ag) genomes. We finally evaluated differential expression of the novel genes in relation to odour exposures relative to no-odour control (unfed flies).

About 45.21% of the sequenced reads had no corresponding transcripts within Gmm gene-set. The reads assembled into 72,428 unique transcripts, most (74.43%) of which had no corresponding genes in the UniProt database. We annotated 592 genes from these transcripts among which 202 were novel while 390 were improvements of existing genes in the Gmm genome. Among the novel genes, 94 had orthologs in Dm, Md or Ag and 88 had homologs in UniProt. These orthologs were putatively associated with oxidative regulation, protein synthesis, transcriptional and/or translational regulation, detoxification and metal ion binding, thus providing insight into their specific roles in antennal physiological processes in male Gmm. A novel gene (GMOY014237. R1396) was differentially expressed in response to the attractant. We thus established significant gap in Gmm genome annotation and identified novel male antennae-expressed genes in the genome among which >53% are potentially Gmm specific.

Keywords: tsetse fly, antennae, *Glossina morsitans morsitans*, novel genes, annotation.



Precision Livestock Farming (PLF) Technologies Evaluation for Smallholder Farming in Africa: A Case Study of Tanzania

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Abstract

Smallholder dairy farmers form the backbone of Tanzania's and across Sub-Saharan Africa dairy sector. Despite its potential to economy and livelihood the productivity remains low, with cows producing an average of 5–6 litres of milk per day compared to 20–30 litters in advanced systems. This gap is largely attributed to herd management practices that rely on visual observation with limited adoption of modern technologies. These constraints lead to reduced milk output, weaken farm resilience, and compromise food security. To address these challenges, an adaptive research initiative introduced Precision Livestock Farming (PLF) technologies to smallholder dairy systems. The project deployed over 290 rumen bolus sensors in dairy cows from 100 dairy farms. The technology collects continuous data on body temperature, estrus detection, rumination, rumen pH, animal activities level, and eating C drinking behaviour, enabling real-time monitoring. Farmers were trained to interpret this information and integrate it into their daily decision-making. The results demonstrated substantial improvements in herd performance. More than 100 cows were timely heat detected and serviced on time. Water-intake monitoring also yielded notable improvement. Initially, 78% of farms showed frequent “low drinking water” alerts, indicating irregular or insufficient water intake. Water intake alerts prompted 50% of these farmers to install constant water supplies hence low to no drinking water alarms. Automated alerts also facilitated early detection of illness, preventing severe disease outbreaks. Access to continuous data has empowered farmers to shift from reactive to proactive management, enhancing their confidence and accelerating the adoption of improved management practices. A preliminary cost-benefit assessment indicates that gains from improved fertility management, reduced disease incidence, and optimized feeding and watering practices offset a substantial proportion of technology investment costs. Increased milk yield, reduced veterinary expenses, and improved calving intervals contribute to positive medium-term returns on investment. However, long-term sustainability depends on the affordability of technology, local technical support, farmer capacity building, and integration into national livestock development strategies. Establishing regional PLF innovation hubs and fostering public–private partnerships are critical to ensuring scalability, cost reduction through economies of scale, and long-term operational sustainability.

Keywords: Precision Livestock Farming, Artificial Intelligence (AI), Sensors, Smallholder dairy systems, Decision-making.



A GEOAI-based smart seed zone recommender system for climate-resilient agriculture in East Africa

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Abstract

Climate variability and increasing agro-ecological heterogeneity pose significant challenges to seed selection and crop productivity. Smallholder farmers constituting the majority of agricultural producers, lack access to timely, location-specific guidance on climate-resilient seed varieties suited to their local agro-ecological conditions. The conventional seed recommendation

approaches are static, coarse-scale and insufficiently responsive to local climate, soil-crop interactions. This paper presents a GeoAI-based smart seed zone recommender system integrating Earth Observation (EO), climate, soil datasets and machine learning to generate spatially explicit, data-driven seed suitability recommendations. The system employs multi-source geospatial inputs, including satellite-derived vegetation indices (NDVI), land surface temperature, rainfall and soil physical and chemical properties and historical seed data. These datasets are harmonized within a geospatial framework and used to train machine learning models: Random Forest classifiers capable of capturing non-linear relationships between environmental variables and seed genotype performance. Deep learning approaches were explored to enhance spatial feature extraction from multispectral imagery. Model performance is evaluated using cross-validation and field-based ground-truthing, achieving high classification accuracy in pilot sites.

A pilot implementation in Nandi County, Kenya demonstrates the system's ability to generate high-resolution seed suitability maps tailored to diverse agro-ecological zones. The resulting seed zone maps are deployed through a web-based GIS decision-support interface designed for seed providers and farmer cooperatives and mobile App and USSD for farmers. Results indicate improved alignment between seed choice, climatic conditions and soil properties, with potential benefits including enhanced yields, reduced crop failure risk and more efficient use of agricultural inputs. This research highlights the potential of responsible AI in advancing food security, climate resilience and sustainable agriculture. By embedding transparency, local data integration and stakeholder engagement, the Smart Seed Zone Recommender System offers a scalable, policy-relevant tool aligning with regional STI priorities, the SDGs and the AU Continental AI Strategy.

Keywords: GeoAI, Seed suitability mapping, Earth observation, Climate-resilient agriculture, Food security.

Parallel Session 1B – AI for Health, Wellbeing & Biomedical Innovation

Session Moderator: Dr. Benson R. Kidenya

Session Rapporteur: Prof Callixte Yadufashije

Presentations:

1. Stroke Risk Prediction using Machine Learning by Boniface Ntambara
2. AI-driven Prediction Model for Cardiovascular Diseases by Asifiwe Makawa
3. Development of a Machine Learning model for predicting and classifying risk factors associated with neonatal deaths at Rakai General Hospital by Nabugewa Fiona
4. Predicting Mosquito Age and Species Using Mid-Infrared Spectroscopy and Artificial Intelligence for Rapid, Reagent-Free Malaria Surveillance by Amos Okot
5. Effectiveness of Science Journalism in Understanding Biomedical Health Innovation through AI-Propelled Digital Herbal Clinical Trials for Community Health in Uganda by Wilson Okaka
6. Predictive Health Supply Chains in Low-connectivity Settings: An Offline-first AI Framework for Uganda by Gideon Luper Abako



Stroke Risk Prediction using Machine Learning

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Abstract

Stroke remains one of the leading causes of mortality and long-term disability in Rwanda, necessitating reliable and accessible early risk prediction tools. This study developed and evaluated a machine learning-based stroke risk prediction system using demographic and clinical variables including age, hypertension, heart disease, BMI, glucose level, smoking status, and residence type. Three classification models Random Forest (RF), Gradient Boosting (GB), and Artificial Neural Network (ANN) were trained and tested using an 80:20 data split. To address class imbalance, SMOTE oversampling was applied, increasing minority stroke cases from 249 to 3,925 records. Performance evaluation using accuracy, precision, recall, F1-score, and confusion matrix analysis demonstrated that the Random Forest model achieved the best results, with 94.78% accuracy and 93.47% F1-score.

The model obtained 81% recall for stroke cases and 92.3% specificity for non-stroke cases, correctly identifying 85 out of 105 stroke patients while minimizing false negatives. Gradient Boosting achieved 93.52% accuracy, while ANN achieved 91.87% accuracy. Threshold optimization (0.35) further improved classification balance. The final model was deployed through a web-based clinical interface and a USSD/SMS platform to ensure accessibility in low-connectivity rural settings. Feature importance analysis identified age, glucose level, BMI, and hypertension as the strongest predictors. The developed system demonstrates strong potential for scalable, AI-driven preventive healthcare in Rwanda and other resource-limited settings.

Keywords: Machine Learning, Artificial Intelligence, Stroke Risk Prediction, Clinical Data, Healthcare Analysis



AI-driven Prediction Model for Cardiovascular Diseases

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Abstract

Cardiovascular diseases (CVD) remain the leading cause of global morbidity and mortality, disproportionately affecting the Sub-Saharan Africa (SSA) region including low and middle-income countries (LMICs). The growing incidence of risk factors such as hypertension, diabetes, dyslipidemia, and silent myocardial ischemia emphasizes the need for early and accurate CVD prediction models. Traditional risk scores rely on limited linear predictors and often fail to detect asymptomatic cases, particularly in resource-constrained settings. This study developed

an advanced machine learning algorithm (MLA) for CVD risk prediction leveraging routinely collected demographic and clinical data, with integration of Renin Angiotensin Aldosterone System (RAAS) biomarkers to improve detection of silent and subclinical CVD presentations. A retrospective dataset of 3,840 de-identified outpatient records was extracted from the Jakaya Kikwete Cardiac Institute (JKCI) electronic medical records (EMR). Eighteen features including age, sex, blood pressure, lipid profiles, BMI, HbA1c, electrolytes, liver and renal markers were preprocessed through data cleaning, expert labelling, encoding, and class balancing with SMOTE. Five supervised ML algorithms (Logistic Regression, K-Nearest Neighbours, Support Vector Machine, Random Forest, and XGBoost) were trained and evaluated using accuracy, precision, recall, specificity, F1-score, ROC-AUC, and cross-validation metrics. Random Forest achieved the highest performance (Accuracy = 92.5%, Recall = 90.0%, AUC = 0.94), outperforming all other models and demonstrating strong ability to identify high-risk individuals accurately. Feature importance analysis revealed age, LDL cholesterol, systolic blood pressure, HbA1c and BMI as the most influential predictors. Explainable AI using LIME enhanced clinical interpretability by highlighting feature contributions for each prediction. The study demonstrates that integrating demographics, clinical and RAAS biomarkers with MLA significantly enhances early CVD risk prediction in asymptomatic patients, supporting scalable, data-driven precision cardiology in LMIC settings.

Keywords: Cardiovascular diseases, machine learning, explainable AI, clinical data



Development of a Machine Learning model for predicting and classifying risk factors associated with neonatal deaths at Rakai General Hospital

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Abstract

Background: Neonatal mortality in Uganda remains a significant challenge, with a rate of 22 deaths per 1,000 live births. Despite numerous efforts to strengthen and invest in primary healthcare, there remains a dearth of effective approaches for identifying the most at-risk neonates who require targeted attention. This study seeks to develop a machine learning-based predictive model to identify at-risk neonates, enabling timely interventions and improved resource allocation to reduce neonatal mortality.

Methods: A design science methodology was used to develop machine learning models for predicting neonatal deaths via retrospective data from Rakai General Hospital from 2020-2024. A total of 5,840 delivery records were extracted from maternity and newborn inpatient registers. Data pre-processing included cleaning, coding, handling missing values, and transforming categorical variables. Model development and analysis were conducted via Python, with logistic regression and random forest algorithms implemented to classify neonatal outcomes. The dataset was split into training and testing sets (80:20), and the models were trained, evaluated, and optimized via performance metrics such as accuracy, recall, precision, and F1 score. The prediction process involved identifying the likelihood of neonatal death and highlighting key risk factors

Results: The random forest classifier effectively predicted neonatal deaths with 99.83% accuracy and a neonatal death predicting model was developed. In addition to prediction, the model

identified key risk factors, including low 5-minute APGAR scores, the absence of postnatal care at 24 hours, low birth weight, and preterm birth. Protective factors included higher APGAR scores, timely postnatal care, and increased maternal experience. These results demonstrate the model's capacity to both classify outcomes accurately and uncover critical risk factors to guide early targeted interventions and improve neonatal survival outcomes.

Conclusion: In this study, PNC at 24 hours emerged as a protective factor against neonatal death, whereas early PNC within 6 hours was more commonly linked to at-risk neonates, suggesting it may reflect response to early warning signs. Furthermore, it adds granularity by showing how the timing of care can impact neonatal outcomes.

Keywords: Neonatal deaths, prediction model, machine learning.



Predicting Mosquito Age and Species Using Mid-Infrared Spectroscopy and Artificial Intelligence for Rapid, Reagent-Free Malaria Surveillance

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Abstract

Introduction: Accurate estimation of mosquito age structure and species composition is central to malaria transmission modelling, insecticide resistance monitoring, and evaluation of vector control interventions. Conventional methods including ovarian dissection and PCR are labour-intensive, reagent-dependent, limiting scalability in endemic regions. We evaluated mid-infrared spectroscopy (MIRS) combined with supervised machine learning as a rapid, non-destructive alternative for entomological surveillance.

Method: We analysed a publicly available dataset containing 41,368 spectra from *Anopheles gambiae*, *Anopheles coluzzii*, and *Anopheles funestus* collected in Burkina Faso, Tanzania, and Scotland. After applying quality-control filters to remove low-intensity or contaminated spectra, selected wavenumbers were used to train and test models for predicting mosquito age classes and species. Several algorithms were evaluated, including Random Forest, logistic regression, and support vector machines. Model performance was compared with traditional methods to assess feasibility for operational surveillance.

Findings: Age prediction showed strong performance, with the Random Forest model achieving 94% accuracy across test datasets. Species prediction achieved moderate accuracy (43%), likely influenced by uneven class representation and the limited diversity of spectral features. Despite this, the approach demonstrates clear potential, particularly for high-throughput age grading, which is critical for assessing vector control interventions and identifying shifts in mosquito longevity associated with insecticide resistance.

Conclusion: These findings indicate that MIRS integrated with machine learning offers a scalable, reagent-free approach for vector phenotyping. With expanded geographic calibration and prospective field validation, this platform could strengthen malaria surveillance by enabling rapid, cost-efficient monitoring of vector population dynamics and earlier detection of transmission risk shifts within endemic health systems.

Keywords: Artificial Intelligence; Mid-Infrared Spectroscopy; Vector Surveillance; Malaria; Machine Learning.



Effectiveness of Science Journalism in Understanding Biomedical Health Innovation through AI–Propelled Digital Herbal Clinical Trials for Community Health in Uganda

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Abstract

Background: Uganda faces a dual health challenge: declining conventional health services and a high reliance on herbal medicine, with over 70% of the population using traditional remedies. Science journalism, combined with AI–propelled digital clinical trials, offers a novel avenue to mainstream Indigenous Knowledge Systems (IKS) into biomedical health innovations while enhancing transparency, governance, and community engagement. Digital readiness remains uneven, with only 38% of rural communities reporting consistent access to online health services.

Problem Statement: Limited understanding of AI-integrated herbal clinical trials among policymakers, researchers, and the public hinders effective adoption. Disconnections between research evidence and policy, digital divides, and gender gaps in health innovation exacerbate inequities. Objectives: (1) Assess the role of science journalism in communicating AI-driven herbal medicine trials. (2) Identify digital gaps and opportunities for online outreach. (3) Evaluate gender empowerment and community health impacts. (4) Inform policy integration of IKS and biomedical research.

Methodology: Systematic literature review (SLR), traffic metrics analysis of online science communication platforms, and policy document analysis. Research Question: How effective is science journalism in enhancing understanding, adoption, and policy translation of AI–propelled digital herbal clinical trials in Uganda? Key Results: Science journalism coverage increased public awareness by 42%, with digital outreach platforms reaching 18,000 rural households. AI analytics optimized herbal trial protocols, generating 25 new digital jobs along the herbal health value chain. Integration with climate-smart agriculture and community health insurance improved preventive care adoption by 32%. Gender Empowerment Measure (GEM) showed a 21% increase in women participating in digital health services

Conclusions: AI-driven digital trials, amplified through targeted science journalism, can bridge research-policy gaps, promote gender equity, and strengthen community health systems. Recommendations include expanding ICT infrastructure, formalizing IKS integration, and scaling digital literacy programs.

Keywords: Science journalism, AI health innovation, herbal medicine, digital health equity, Uganda



Predictive Health Supply Chains in Low-connectivity Settings: An Offline-first AI Framework for Uganda

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Abstract

Uganda's health system faces a critical supply chain crisis, particularly in the Karamoja region and refugee-hosting districts. A 2025 baseline assessment of ten facilities revealed that

100% experienced stockouts of essential medicines in the preceding year, with infrastructure constraints correlating strongly ($r=-0.695$) with supply disruptions. This paper presents a validated Tiered Forecasting framework designed to optimize health commodities in these fragile settings. Unlike standard cloud-based solutions, this framework operates on an offline-first architecture, addressing the reality that 89% of target facilities lack reliable internet. The methodology integrates three distinct forecasting tiers. Tier 1 runs locally on mobile devices using rule-based logic and seasonal adjustments, functioning without connectivity. Tier 2 and 3 utilize Hierarchical Exponential Smoothing (HES) and machine learning models (XGBoost) at the district level to identify cross-facility trends and stockout risks.

The system employs a human-in-the-loop protocol, allowing health workers to override algorithmic recommendations during disease outbreaks or delivery failures, logging these decisions to retrain the model. Results from the technical validation with Kyambogo University confirm the feasibility of this architecture for low-resource environments. The framework introduces specific equity weighting for refugee-serving facilities to counter historical allocation biases. By treating storage capacity as a hard constraint rather than a variable, the model prevents overstocking in facilities with inadequate infrastructure. This research offers a scalable blueprint for deploying predictive AI in humanitarian health systems where connectivity is intermittent, but the need for medicine availability is constant.

Keywords: Predictive Analytics, Offline-first AI, Health Supply Chain, Health Equity, Health Data Management.

Parallel Session 1C – AI for Education, Skills Development & Research Excellence

Session Moderator: Charles Wanyonyi

Session Rapporteur: Everlyne Akoth Odera

Presentations:

1. Administrative Intelligence: Quantifying Drivers of AI Adoption for Efficiency in Ugandan Universities by Wilberforce Mfitundinda
2. Semantic-Driven Sign Motion Generation via Hierarchical Discrete Tokenization and Masked Transformers by Anthony Marugu
3. Transforming Research Governance through Artificial Intelligence: Opportunities and Challenges in Tanzanian Universities by Simon Ngalomba
4. Leveraging Open Education Data and Artificial Intelligence for Data-Driven Institutional Governance in Uganda's Tertiary Education Sector by Dr Gastervas Geoffrey Rutwara Mugume
5. Artificial intelligence in academic practice: Patterns of use and student perceptions in Kenyan universities by Dr Florence Kamonjo



Administrative Intelligence: Quantifying Drivers of AI Adoption for Efficiency in Ugandan Universities

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Abstract

Artificial Intelligence (AI) offers transformative potential for improving administrative efficiency, resource optimization, and governance within higher education institutions. However, structured empirical evidence quantifying determinants of AI adoption in Ugandan universities remains limited. This study provides pilot-level evaluation of institutional readiness and predictors of AI-driven administrative system adoption. A cross-sectional quantitative study was conducted across eight accredited Ugandan universities using multistage sampling. A total of 368 academic and administrative personnel participated. Data were collected through a validated structured questionnaire grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT), demonstrating strong internal consistency (Cronbach's $\alpha = 0.89$). Statistical analyses were performed using SPSS v28 at a 95% confidence level, incorporating descriptive statistics, Pearson correlation, and multivariate logistic regression. Findings showed that 71.4% of respondents exhibited high preparedness for AI integration into administrative workflows. Significant independent predictors of AI adoption included perceived usefulness (AOR = 3.32, $p < 0.001$), organizational support structures (AOR = 2.78, $p = 0.004$), digital competence (AOR = 2.51, $p = 0.012$), and data privacy assurances (AOR = 2.03, $p = 0.018$). Institutions with established digital ecosystems demonstrated significantly greater predicted adoption probabilities than those relying on predominantly manual systems. Measured institutional performance expectations associated with AI integration included enhanced student information management efficiency (72.1%), improved data-driven decision-making (68.9%), reduced administrative processing time (64.7%), strengthened transparency (61.5%), and workload optimization (59.8%). Findings provide structured empirical evidence that advancing administrative intelligence in Ugandan universities is quantifiably feasible and strategically advantageous, contingent upon sustained investment in digital capacity building, secure infrastructure, governance frameworks, and institutional change management.

Keywords: Administrative Intelligence, AI Adoption, UTAUT, Institutional Efficiency, Ugandan universities



Semantic-Driven Sign Motion Generation via Hierarchical Discrete Tokenization and Masked Transformers

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Abstract

Motion-S is a novel framework for **text-driven 3D sign language generation**, specifically designed to bridge the accessibility gap for the **deaf and hard-of-hearing community**. By integrating **hierarchical discrete modelling** with **masked transformers**, the system produces fluid, semantically accurate 3D animations from glossified text inputs. The framework delivers three primary technical contributions. First, it features a comprehensive motion processing pipeline that converts raw BVH data into D-Pose features, a 668-dimensional vector incorporating 6D rotations, joint velocities, and foot contact signals. This representation faithfully preserves the full-body and intricate hand articulations critical to sign language expression. Second, a **Residual Vector Quantization Variational Autoencoder (RVQ-VAE)** encodes motion sequences into discrete tokens across six hierarchical layers: a base layer captures coarse motion

structure, while five residual layers progressively add fine-grained details. This approach yields high reconstruction fidelity alongside 4× temporal compression, enabling efficient modeling of complex sign sequences. Third, Motion-S employs a two-stage transformer architecture, a **Masked Transformer** generates base tokens through iterative prediction enhanced by classifier-free guidance, followed by a **Residual Transformer** that autoregressively predicts the finer residual layers. Evaluated on the Motion-S Dataset, comprising 11,958 sequences of **Kenyan Sign Language (KSL)**, the model surpasses flat-token baselines on key metrics such as FID (Fréchet Inception Distance) and R-Precision, demonstrating superior semantic alignment and motion quality. By discretizing sign language’s unique spatial-visual grammar into hierarchical tokens, Motion-S paves the way for realistic 3D avatar animations suitable for real-time translation and educational applications. In terms of **real-world deployment**, frameworks like Motion-S hold strong potential for integration into accessibility tools, such as 3D avatar-based sign language interpreters in educational platforms, public announcements, healthcare consultations, or mobile apps. Similar systems are already emerging in practice, for instance, Kenyan-developed apps like TERP-360 use AI and motion capture to translate speech/text into real-time KSL via 3D avatars, aiding interactions in classrooms, medical settings, and daily life. Motion-S could extend such efforts by enabling higher-fidelity, semantically precise KSL generation from glossed text, supporting low-resource sign languages like KSL where data scarcity remains a challenge. Deployment could involve API integration for virtual assistants, video conferencing tools, or e-learning platforms, with optimizations for low-latency inference on edge devices. However, ethical considerations are paramount in advancing such technologies. Key concerns include:

- Cultural authenticity and representation, AI-generated signs must respect the linguistic and cultural nuances of KSL and Deaf communities to avoid misrepresentation or oversimplification of grammar, non-manual signals (e.g., facial expressions), and regional variations. Poorly trained models risk producing “inauthentic” signing that could undermine trust or even propagate stereotypes.
- Data privacy and consent, Training on motion capture from real signers requires explicit, informed consent, anonymization, and fair compensation to prevent exploitation of Deaf contributors.
- Risk of replacement vs. augmentation, While Motion-S augments accessibility (e.g., for one-way communication or learning tools), over-reliance on avatars could diminish demand for human interpreters in critical contexts like legal or medical settings, where empathy, context, and bidirectional nuance are essential. Ethical deployment prioritizes human oversight and hybrid approaches.
- Bias and inclusivity, Models must be evaluated for biases in generation (e.g., underrepresenting certain signer demographics) and include diverse training data to ensure equitable performance across ages, genders, and regional KSL dialects.
- Transparency and accountability, Users should be informed when content is AI-generated, with mechanisms for feedback to Deaf communities to iteratively improve cultural appropriateness.

By addressing these ethical dimensions through community involvement, rigorous validation with Deaf KSL users, and rights-based design, Motion-S can contribute meaningfully to inclusive AI that empowers rather than supplants human sign language expertise.

Keywords: Sign Language Generation, Text-to-Motion, RV -VAE, Masked Transformers, Kenyan Sign Language (KSL), 3D Animation, AI Accessibility, Ethical AI.



Transforming Research Governance through Artificial Intelligence: Opportunities and Challenges in Tanzanian Universities

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Abstract

This study explores the transformative potential of Artificial Intelligence (AI) to enhance research governance in Tanzanian universities, while critically examining the challenges that may hinder its adoption. In an era where universities are expected to produce high-quality, impactful research, AI offers opportunities to streamline research management, improve data-driven decision-making and enhance transparency and accountability in research processes. The study is grounded in Technology-Organization-Environment (TOE) theory, which frames AI adoption as a function of technological capabilities, organizational readiness and environmental pressures. A qualitative research design was employed to gain in-depth insights from key stakeholders involved in research governance. Purposive sampling was used to select 21 participants, including research administrators, faculty members and IT specialists from three major Tanzanian universities. Data were collected through semi-structured interviews and document reviews, ensuring triangulation for credibility. Thematic analysis was applied to identify recurrent patterns and themes relating to AI adoption and its impact on research governance. The study revealed that AI offers substantial opportunities to automate research approval workflows and enhance data management efficiency. AI improves monitoring and evaluation processes, enabling better compliance with research ethics and funding requirements. Significant challenges were identified, including inadequate technological infrastructure, limited AI literacy among staff and resistance to change. Fourth, institutional policies and leadership commitment were critical in mediating the successful integration of AI in research governance. While grounded in the Tanzanian higher education context, this study advances analytically generalizable insights into the structural conditions under which Artificial Intelligence can transform research governance in emerging university systems. By extending the Technology-Organization-Environment framework to academic governance and reframing AI as institutional infrastructure rather than a mere efficiency tool, the study contributes both theoretically and practically to global debates on digital transformation in higher education. Its findings are particularly transferable to universities functioning with limited resources, regulatory centralization, and rapid expansion pressures, thereby positioning the study as a meaningful contribution to scholarship on AI-enabled governance reform in the Global South. The study concludes that while AI has the potential to significantly transform research governance in Tanzanian universities, realizing these benefits requires strategic investment in infrastructure, capacity building and policy development. By addressing these challenges, universities can leverage AI to foster a more efficient, accountable and innovative research environment.



Leveraging Open Education Data and Artificial Intelligence for Data-Driven Institutional Governance in Uganda's Tertiary Education Sector

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Abstract

In Uganda's higher education sector, fragmented information systems, inadequate analytics infrastructure, and limited interoperability continue to limit the efficient use of data for institutional administration, strategic decision-making, and governance. To illustrate how artificial intelligence (AI) and machine learning (ML) can facilitate AI-driven decision-support systems for data-driven institutional governance, this paper describes the design and implementation of a modular, open dataset architecture for the Uganda Open Education Data Portal (UG-OEDP) Pilot Project. The study utilised the Uganda Institute of Information and Communications Technology (UICT) as a pilot case, employing a mixed-methods approach that incorporated document analysis, stakeholder consultations, and iterative system development. We cleaned up, anonymised, and turned data from EMIS, ACMIS, and internal institutional records into open education datasets that can work with AI. A mix of Agile and Waterfall methods guided the development of the platform, which included secure APIs, PostgreSQL databases, Python Flask services, and visualisation tools like Power BI and Dash. The platform that emerges from these features has AI-powered dashboards and real-time analytics for key administrative tasks, such as predicting enrolment, identifying academic risks, optimising staffing, and planning based on evidence. Usability testing and stakeholder feedback showed that the system was highly acceptable and that institutions showed strong interest in educational administration analytics. Scalability is built in through a modular microservices architecture, standards-based data interoperability, and open-source technologies. This enables the system to be customised to other tertiary institutions in the East African Community. To make things more sustainable, we are building our staff's skills, integrating governance into our planning processes, using low-cost, open-source infrastructure, and complying with Uganda's Data Protection and Privacy Act (2019). The results indicate that resource-limited institutions can implement scalable, sustainable AI-driven open education data platforms to enhance institutional efficiency, research management, and digital transformation throughout higher education systems in East Africa.

Keywords: Artificial Intelligence in Education, Educational Administration Analytics, Open Education Data, AI-Enabled Decision Support Systems, Data-Driven Institutional Governance.



Artificial intelligence in academic practice: Patterns of use and student perceptions in Kenyan universities

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Abstract

This study explored the integration of Artificial Intelligence (AI) in higher education among university students in Kenya, highlighting their awareness, usage, and perceptions. A survey of 407 students from five universities showed a high awareness of AI (96.8%) and notable adoption (70.8%), mainly for online research (46.2%), assignment assistance (25.1%), and content summarization (11.1%). ChatGPT emerged as the most popular AI tool (43.5%). Students generally view AI positively, believing it enhances learning and offers personalized feedback. However, significant concerns persist: 62.5% worry about AI replacing human teachers, 57.6% fear over-reliance hindering critical thinking, and 50.6% have experienced technical issues. Barriers for non-users include limited knowledge (10.3%) and skills (4.7%). While students actively utilize AI and hold favourable opinions on its utility, ethical and practical issues remain prominent. The study recommends that the Kenyan government develop AI competency frameworks to guide safe and effective application by educators and learners. Universities should establish clear policies and pedagogical frameworks to maximize AI's benefits while addressing challenges related to digital equity, academic integrity, and critical thinking development.

Keywords: Academic practice, artificial intelligence, student's perceptions.

Parallel Session 2D – AI for Climate Resilience, Environment & Natural Resources

Session Moderator: Prof. Nzioka John Muthama

Session Rapporteur: Dr. Pancras Ndokoye

Presentations:

1. Using Machine Learning and Satellite Data for Improving Flood Prediction in the Rusizi Basin by Jean Claude Hakizimana
2. Transforming Smallholder Resilience: An AI-Driven Framework for Climate-Smart Agriculture in Kakamega County, Kenya by Prof. Caroline Mulinya
3. Analysis of AI driven flood forecast system in Uganda by Richard Cartland
4. Data-driven climate action: A geospatial AI tool for optimizing regional climate investments by Mati Rita
5. Medicinal and nutritional floristic Potential of relict forests in Kaziba traditional landscape Eastern DR Congo: Identification Using Digital Network Platform and Database by Senior Diop Ndeko Mubembe



Using Machine Learning and Satellite Data for Improving Flood Prediction in the Rusizi Basin

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Abstract

Floods are among the most destructive natural hazards, particularly in Africa, where climate change, rapid urbanization, and data scarcity amplify their impacts. The Rusizi sub-Basin has experienced recurrent floods that caused major socio economic disruptions between 2014 and 2023. Traditional hydrological forecasting is limited by scarce observations and the complexity of river dynamics. This study investigates the potential of machine learning, specifically Long Short-Term Memory (LSTM) and Convolutional LSTM (ConvLSTM) models, combined with satellite and hydrological datasets, to enhance flood prediction in the Rusizi Basin. Using ERA5 reanalysis meteorological data, river discharge records, and satellite-derived DEMs, the ConvLSTM model achieved high predictive skill ($R^2 = 0.95$, $NSE = 0.96$, $RMSE \approx 0.0023$), outperforming standard LSTM ($R^2 = 0.96$). Flood risk maps were also generated for water levels of 4 m, 10 m, and 12 m. Results demonstrate that integrating AI-based models with satellite data significantly improves flood forecasting, providing valuable decision-support tools for early warning and disaster risk reduction. Future integration with real-time monitoring and socio-economic vulnerability data could further strengthen climate resilience strategies.

Keywords: Flood prediction; Machine learning, Era5, Lake Tanganyika, climate resilience.



Transforming Smallholder Resilience: An AI-Driven Framework for Climate-Smart Agriculture in Kakamega County, Kenya

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Abstract

Climate change poses a serious threat to agricultural productivity and food security in sub-Saharan Africa, calling for innovative and adaptive farming solutions. This case study explores how Artificial Intelligence (AI) can serve as a catalyst for climate-smart agriculture (CSA) in Kakamega County, Kenya is a region known for smallholder farming and high vulnerability to climate variability. The research uses a mixed-methods approach combining geospatial analysis, sensor data, and farmer surveys to evaluate AI-driven interventions. It specifically looks at deploying machine learning models for localized weather prediction, computer vision for early pest and disease detection in crops like maize and sugarcane, and data-driven advisory systems for better irrigation and input management. Results show that AI tools can boost climate resilience by increasing forecast accuracy, lowering crop losses, and encouraging resource-efficient practices.

However, the study also highlights key barriers to adoption, including digital literacy gaps, infrastructure challenges, and data accessibility issues. The Kakamega County case demonstrates that while AI has transformative potential to achieve CSA's three main goals of higher productivity, improved resilience, and lower emissions, its success depends on context-specific design and strong support frameworks involving farmer cooperatives, extension services, and public-private partnerships. This study offers a practical guide for expanding AI-assisted agriculture in similar ecological zones.

Keywords: Artificial Intelligence (AI), Climate-Smart Agriculture (CSA), Climate Change, Sub-Saharan Africa, Smallholder Farmers, Food Security, Climate Resilience, Predictive Analytics, Machine Learning, Precision Agriculture.



Analysis of AI driven flood forecast system in Uganda

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Abstract

This paper presents FloodSense, an AI-driven flood forecast and early-warning system developed to enhance the speed, accuracy, and community integration of flood-risk management in Uganda. Motivated by the persistent limitations of traditional flood management approaches characterized by slow response times averaging 1.8 hours, low data resolution below 60% spatial coverage, and limited public engagement of less than 25% community participation, the project explores how artificial intelligence, machine learning, and real-time sensing technologies can provide a more proactive and data-centric solution. FloodSense integrates multi-source datasets comprising over 26,000 hourly environmental records, including live IoT sensor readings with 5-minute sampling intervals, LiDAR-derived terrain models, soil moisture and infiltration properties, hydrological patterns, and three years of historical flood records. These inputs feed into a hybrid AI engine trained using TensorFlow-based models capable of identifying weather-related trends and generating localized flood predictions with an overall accuracy of 92.4% compared to baseline models. The prototype includes a web-based platform with an interactive dashboard that visualizes flood-prone zones and risk classifications categorized into low (0–40%), moderate (41–70%), and high-risk (above 70%) probability thresholds. Its predictive alert module provides automated early warnings within an average lead time of 3.5 hours to municipal authorities, disaster response teams, and the general public through SMS and web notifications, achieving a 94% improvement in response window duration compared to traditional threshold-based systems. A citizen-science component enables residents to submit real-time field reports, increasing data granularity by approximately 35% and strengthening situational awareness during peak rainfall events. System development followed a structured methodology with data collection from climate focused websites, AI model training and iterative user testing by the trainers. Early results indicate significant improvements in prediction accuracy from 81.6% in conventional regression approaches to 92.4% in the proposed system, alongside enhanced alert timeliness and reduced false negatives demonstrating the system's potential to support evidence-based drainage planning, emergency preparedness, and climate-resilience initiatives. FloodSense offers a scalable and cost-effective framework with an estimated 30% lower deployment cost compared to conventional hydrological monitoring systems, adaptable to other flood-prone regions in Uganda and across East Africa. The project also aligns with Sustainable Development Goal 13 on climate action by fostering community participation, enhancing urban resilience, and supporting data-driven disaster-risk reduction. The paper concludes that AI-powered solutions such as FloodSense represent a transformative step towards smarter, more adaptive flood-management ecosystems.

Keywords: Artificial Intelligence, Flood Forecasting, IoT Sensors, Machine Learning, Climate Resilience.



Data-driven climate action: A geospatial AI tool for optimizing regional climate investments

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Abstract

East African Community (EAC) member states face intensifying climate challenges including recurrent droughts, flooding, land degradation, and erratic rainfall patterns that threaten food security, water resources, and livelihoods across the region. Despite availability of climate finance funding from sources like the Green Climate Fund and African Development Bank, decision-makers lack standardized, data-driven frameworks to objectively prioritize climate adaptation and mitigation projects across diverse geographical and socio-economic contexts. Current climate finance allocation in the EAC relies on fragmented, subjective approaches that fail to leverage available geospatial and socio-economic data. This causes poor resource allocation, opaque decisions, weak donor justifications, and unequal investment distribution across member states.

This study develops an AI Data-driven Regional Climate Financing Tool that provides transparent, evidence-based prioritization of climate projects across EAC member states, ensuring optimal and equal allocation of limited resources. The tool integrates geospatial and Remote Sensing data, machine learning including satellite-derived climate hazard indicators (CHIRPS rainfall anomalies, NDVI from Sentinel-2, flood hazard maps), socio-economic vulnerability metrics from WorldPop and World Bank sources, and project metadata (cost, beneficiaries, implementation timeline). Machine learning algorithms including Random Forest and Gradient Boosting (XGBoost) are trained to predict project success probability and impact scores. Multi-Criteria Decision Analysis through Analytic Hierarchy Process and weighted overlay techniques combine hazard exposure, vulnerability, and project characteristics. An optimization module using linear programming maximizes climate impact while ensuring equitable distribution across member states. This research AI tool aligns with EAC Climate Change Policy Framework for coordinated, evidence-based climate action enabling governments, NGOs, and donors to make more informed and equitable climate and natural resource management decisions for a resilient East Africa.

Keywords: Climate finance, Geospatial AI, Data-driven Climate Action.



Medicinal and nutritional floristic Potential of relict forests in Kaziba traditional landscape Eastern DR Congo: Identification Using Digital Network Platform and Database

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Abstract

The Democratic Republic of Congo, although home to a significant diversity of flora, faces major challenges in terms of food security and access to healthcare. Relict forests are recognized as being of significant importance in plant-based food and medicine. This study aims to conduct an inventory of these plants and document their traditional applications within the Kaziba chiefdom of the Democratic Republic of Congo. An ethnobotanical survey was conducted among 96 respondents residing in areas with natural forests. The data collection process encompassed individual interviews, focus groups, and structured questionnaires. The PlantNet digital network App and African Plant Database were used for plant identification. Literature Review was used to validate the uses of the plants based on what has been found elsewhere. According to usage, 23 species for food (fruit 64.2%, leaves 28.5%, stems 21.4%) and 43 species for medicinal use (leaves 62.8%) have been recorded. The analysis of local knowledge indicates that 67.1% of species are well-known, 20.5% are little-known, and 13.4% are rarely mentioned.

The relict forests of Lwampango and Kamano are considered richer in medicinal and food species. However, there is a decline in the availability of these species, with 41.6% of respondents reporting difficulty in accessing them, and 79% perceiving a decline in their abundance over the last decade. The primary threats identified to the long-term survival of these species include the exploitation of firewood (33%), grazing (27%), the conversion of forests to farmland (24%), and bushfires (10%). To conserve these resources, respondents proposed various strategies, including the establishment of a permanent local conservation structure (36%), the enhancement of community awareness (33%), and the rehabilitation of degraded sections of these ecosystems (13%). This study underscores the significance of the relict forests of Kaziba traditional landscape for rural communities' food and health security.

Keywords: Relict forests, ethnobotany, food plants, medicinal plants, natural resource management.

Parallel Session 2E – AI for Industry, Service Delivery & Digital Economy

Session Moderator: Prof. Joel S. Mtebe

Session Rapporteur: Prof. Jude Lubega

Presentations:

1. Design and Validation of Trust-Weighted Machine Learning Models for Predicting Multi-Factor Authentication Adoption Using the Unified Theory of Acceptance and Use of Technology (UTAUT) Framework by Richard Kimera
2. Bearing fault detection and diagnosis based on an optimized densely connected convolutional network and an improved residual network by Dr Julius Niyongabo
3. Implementation of QR Code Payments to Streamline Patient Billing at Avenue Hospital Kisumu by Damaris Apondi Were
4. Development of a predictive model for determining temperature distribution in concrete slab using embedded sensors by Benon Omwenga Nyabuto
5. Intelligent Solar Monitoring System by Richard Cartland
6. AI for governance, ethics and regional cooperation by Immanuel Mwendwa Kiilu



Design and Validation of Trust-Weighted Machine Learning Models for Predicting Multi-Factor Authentication Adoption Using the Unified Theory of Acceptance and Use of Technology (UTAUT) Framework

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Abstract

The rapid expansion of digital financial services has increased exposure to fraud and identity theft, intensifying the need for robust authentication mechanisms such as Multi-Factor Authentication (MFA). Despite its proven security benefits, MFA adoption remains low in many low-resource settings. In Uganda, only about 18% of digital finance users enable MFA, even as transaction volumes continue to rise. This study designs and validates a trust-weighted machine learning framework for predicting MFA adoption by integrating the Unified Theory of Acceptance and Use of Technology (UTAUT) with empirically derived trust and security perception weights to better capture socio-technical adoption dynamics. Using the nationally representative FinScope Uganda 2023 dataset ($n = 3,176$), complemented by a synthetic dataset for robustness testing, features were engineered to represent UTAUT constructs performance expectancy, effort expectancy, social influence, and facilitating conditions while aligning with NIST SP 800-63B digital identity assurance guidelines. Logistic Regression, Random Forest, Gradient Boosting, and XGBoost models were trained, with trust-weighting applied to modulate feature influence based on users' security perceptions and confidence in digital systems. Results indicate that trust-weighting consistently improves predictive performance. On real-world data, the trust-weighted Gradient Boosting model achieved an accuracy improvement from 78.5% to 84.1%, an F1-score increase from 0.690 to 0.750, and an AUC-ROC gain from 0.780 to 0.840. Validation on synthetic data confirmed model stability, with accuracies exceeding 82%. Model explainability using SHAP identified security perceptions, mobile access, and prior fraud awareness as dominant predictors, while latent space clustering revealed four distinct user segments to inform targeted adoption strategies. To assess practical applicability, a Kotlin-based mobile prototype was evaluated with 120 users, with 83% reporting high usability and clarity. By embedding behavioural trust into predictive modeling, this study advances a human-centred approach to cybersecurity analytics and provides policymakers, regulators, and system designers with a validated, data-driven tool for promoting inclusive and context-aware MFA adoption in resource-constrained digital finance ecosystems.

Keywords: Multi-Factor Authentication, UTAUT, Trust-Weighted Machine Learning, Technology Adoption, Cybersecurity, Digital Finance, Low-Resource Settings, Software Validation



Bearing fault detection and diagnosis based on an optimized densely connected convolutional network and an improved residual network

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Abstract

Over the past recent years, bearing fault detection and diagnosis has been a key challenge in research field and industrial sector. Various models, including the traditional methods and Artificial Intelligence have been developed by researchers to detect faults on bearing and minimize its downtime. However, recent studies have converged on the use Deep Learning (DL) tools to effectively detect and diagnose bearing faults because they offer significant advantages including the ability of extract complex features and patterns from data. One of the most used DL tool is Convolutional Neural Network (CNN), which can easily detect faults in real-world industrial environment or incomplete datasets. Recently, various variants that enhance the capabilities and applicability of CNN have been proposed to recognize bearing faults in diverse industrial scenarios.

In this paper, an intelligent hybrid advanced fault diagnosis system based on an optimized densely connected Convolutional Network (DenseNet) and an improved Residual network (ResNet) has been applied on CWRU dataset, the valuable resource for bearing fault detection and diagnosis research. The obtained results and the comparison with different faults diagnosis algorithms show that the proposed deeper and wider model enhances the robustness and adaptability of CNN in intelligent bearing faults classification and diagnosis. Moreover, this powerful hybrid framework can be effectively applied to identify bearing complex faults in order to minimize its downtime and maximize the productivity in industries.

Keywords: Bearing, DenseNet, ResNet, fault detection and diagnosis, CWRU dataset.



Implementation of QR Code Payments to Streamline Patient Billing at Avenue Hospital Kisumu

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Abstract

Digital financial innovations are increasingly central to enhancing operational efficiency and patient satisfaction in healthcare facilities. At Avenue Hospital Kisumu, conventional payment methods—such as M-Pesa till numbers, Visa, and cheques—led to delays, reconciliation challenges, and workflow inefficiencies. This study evaluates the implementation of a QR code-based payment system and its impact on service delivery and financial operations. A mixed-methods design was employed, combining quantitative metrics (transaction speed, accuracy, satisfaction scores) with qualitative insights from key informant interviews, staff feedback, and observation checklists. Data were collected from 20 finance and IT staff, 5 departmental heads, and 100 patients during the pilot phase. Analyses included descriptive statistics, paired t-tests, thematic coding, and a cost-benefit assessment. Results show substantial improvements: most transactions were completed in under three minutes; billing accuracy increased due to reduced manual entry; more than 80% of patients rated the system as satisfactory or very satisfactory; and staff reported faster reconciliation and lighter administrative workloads. Key enablers included comprehensive training, system compatibility with existing digital platforms, and strong management support. Digital literacy gaps among some users emerged as the main challenge. The study highlights the transformative potential of QR code technology in streamlining healthcare payments, improving patient experience, and enhancing financial efficiency. With broader rollout and continuous optimization, such systems can serve as scalable digital finance

solutions for healthcare institutions seeking to modernize their operations.

Keywords: R Code Payments, Digital Health Innovation, Financial Technology, Patient Experience, Hospital Efficiency



Development of a predictive model for determining temperature distribution in concrete slab using embedded sensors

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Abstract

This research addressed the challenge of determining temperature distribution in concrete pavements in tropical climates, given the significant thermal induced expansions and contractions leading to rapid pavement deterioration. Present models are generally calibrated for temperate conditions in the temperate regions, hence doesn't suit the tropical regions. To fill this gap in knowledge, a data-driven predictive model was developed and validated using embedded digital temperature sensors in a large-scale outdoor concrete slab. A 1 m×1 m× 300mm concrete slab was embedded with five DS18B20 sensors at depth increments of 50 mm, recording temperature every five minutes for at most two three months with an Arduino UNO R4 Wi-Fi microcontroller. Following quality control and gap filling, the initial data analysis revealed strong diurnal cycles and phase lags with depth. Modelling was performed in multiple steps, including lagged linear regression to capture temporal inertia; piecewise polynomial regression to capture nonlinear thermal responses under heating and cooling regimes; and Random Forest regression ensemble. The Random Forest model effectively exploited interactions among time-of-day features, the surface sensor's measurements and gradients between sensors. At every sensor depth, model performance was tested across four thermal regimes and the Random Forest Model gave root-mean-square errors lower than 0.15 °C and coefficients of determination (R²) greater than 0.99. Surface temperatures described 60-80% of the prediction ability. Hence, the framework provides pavement engineers with a strong, interpretable and computationally efficient platform to customize concrete pavement design for tropical environments. Future work will include gap-filling of cooling at deep layer levels, working toward real-time visualization and implementing long-term trials to improve model generalization.

Keywords: Artificial Intelligence, Concrete Pavement, Temperature Distribution, Random Forest Regression, Predictive Modeling.



Design and construction of an intelligent solar power performance monitoring system

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Abstract

This paper presents the design and construction of an intelligent solar power performance monitoring system aimed at improving the efficiency of photovoltaic (PV) energy harvesting. The study focuses on the design, simulation, and performance comparison of tracked and untracked

solar panels based on real-time current and voltage measurements. Although solar energy is a reliable renewable resource, its performance is often affected by weather variability, panel degradation, and system inefficiencies. To overcome these challenges, the proposed system integrates a fuzzy logic-based artificial intelligence (AI) controller to enhance monitoring accuracy and tracking performance.

The system is implemented using an Arduino UNO microcontroller programmed through the Arduino Integrated Development Environment (IDE), while Proteus ISIS is used for system simulation. Real-time current, voltage, and irradiance data are processed by the fuzzy logic controller to intelligently adjust the orientation of the solar panel via a stepper motor, ensuring maximum solar irradiance capture under varying environmental conditions. Experimental results demonstrate that the AI-assisted solar tracking system significantly improves power output compared to a conventional fixed PV system. The fuzzy logic approach enhances tracking accuracy, system responsiveness, and overall energy efficiency. The proposed system offers a low-cost, practical, and intelligent solution for solar performance monitoring and optimization, making it suitable for small- and medium-scale renewable energy applications.

Keywords: Photovoltaic, Weather variability, fuzzy logic, Stepper motor, Renewable energy



Auditing the Algorithms: Ethical Oversight and AI Readiness in the East African Community (EAC)

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Abstract

Artificial Intelligence (AI) is rapidly reshaping public service delivery and economic systems across the East African Community (EAC). While its transformative potential is evident, uneven ethical safeguards and fragmented readiness levels across Partner States pose significant risks, including algorithmic bias, opaque decision making, data misuse, and unequal technological benefits. This paper develops a contextualized Ethical AI Readiness Framework for the East African Community to assess how prepared Partner States are to adopt and govern AI in a responsible and inclusive manner. The study relies exclusively on secondary data drawn from national policies, regulatory documents, institutional reports, and publicly available strategic plans. Four Partner States, namely Kenya, Tanzania, Uganda, and Rwanda, are examined to reflect varying levels of AI policy development. The analysis incorporates global normative instruments, including the African Union Continental AI Strategy, UNESCO's AI Ethics Recommendation, and the OECD AI Principles, situating these standards within the socio-political and institutional realities of East African Community. The paper introduces a readiness model organized around five pillars, namely regulatory maturity, data governance, institutional accountability, inclusion and rights protection, and socio technical preparedness. Using this model, the study evaluates the ethical and institutional landscape across Partner States and identifies structural gaps in oversight mechanisms. The findings reveal asymmetries in regulatory development, limited institutionalization of algorithmic auditing procedures, fragmented cross border coordination, and insufficient safeguards for transparency and accountability. These disparities indicate that AI governance within the East African Community remains largely nationally driven rather than

regionally harmonized. The paper concludes that ethical AI readiness in East African Community requires coordinated regional governance mechanisms. It recommends the establishment of a Regional AI Ethics and Accountability Council under EASTECO, the adoption of harmonized algorithmic audit standards, and the development of an annual AI Readiness Index for the East African Community to strengthen benchmarking, policy alignment, and accountable AI deployment across Partner States.

Keywords: AI Ethics, Algorithmic Accountability, Regional Cooperation, Readiness Assessment, East African Community

Parallel Session 2F – AI for Education, Skills development & Research Excellence

Session Moderator: Dr. Joshua K. Kibet

Presentations:

1. A Low-Cost AI Onboarding Agent Suite for Tertiary Education Institutions in Africa by Dr Fredrick Edward Kitoogo
2. Bridging the Digital Divide: Evaluating ICT e-Readiness in Kenyan Higher Education Institutions by Ndolo Daniel Mulinge
3. Democratizing Animation: AI-Driven Pipeline Optimization in Emerging Creative Markets by Japheth Mandela Isaboke
4. Ethical AI Governance in Resource-Constrained Higher Education. A case of Kabale University framework by Dr. Businge Phelix Mbabazi
5. Teacher Support and professional development Needs that influence Adoption of Artificial Intelligence in the Teaching process at public universities. A case of Teaching staff at Makerere University Business school Uganda by Lawino Giovanna
6. Artificial Intelligence as a Catalyst for Pedagogical Transformation in Higher Education: Case of Academic Staff of the Inter-University Council of East African Member Institutions by Lucian Ngeze



A Low-Cost AI Onboarding Agent Suite for Tertiary Education Institutions in Africa

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Abstract

Tertiary Education Institutions within Africa are continually challenged with the onboarding of students, staff and governing bodies alike. Challenges associated with these onboarding processes include poor access to information, time consuming orientations, insufficient digital infrastructure and administrative workload. Poor onboarding processes reduce the quality of services, increase risk of non-compliance, delay productivity and ultimately affect the overall

efficiency of institutions. This paper presents a low cost, customizable artificial intelligence (AI) onboarding agent suite designed to assist with structured, role specific onboarding in resource constrained institutional environments. This model includes three speciality AI agents; a Student Onboarding Agent, a Staff Onboarding Agent and a Governing Council Onboarding Agent. Each agent provides role specific assistance through policy grounded responses, procedural checklists, summarizing documents and workflow support based on the official institutional resources. This solution utilizes lightweight Large Language Models (LLMs), modular agent architecture, retrieval augmented generation and offline first deployment to enhance affordability, flexibility and data sovereignty.

A customization layer supports institutional tailoring of workflows, branding, terminology, and access. A demonstration ready prototype was developed utilizing widely available and locally deployable AI components. This model also incorporates principles of Data Governance and Responsible AI to ensure the usability, transparency, and privacy protection while aligning with emerging practice. Finally, this system is designed to support decision making with built in governance and human escalation mechanisms. Task completion and the correct selection of tools and policy sources were utilized as evaluation metrics. Preliminary results demonstrate that low resource AI onboarding agents can complete tasks and select the correct tools and policy sources without requiring costly infrastructure. Ultimately, this framework supports the implementation of resilient, inclusive practices and supports scalable adaptation.

Keywords: Artificial Intelligence, Institutional Onboarding, AI Agents, Responsible AI, Africa.



Bridging the Digital Divide: Evaluating ICT e-Readiness in Kenyan Higher Education Institutions

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Abstract

The recognition of digital infrastructure readiness as a foundational pillar of national innovation systems is growing. This study examines how ready Kenyan higher education institutions are for ICT from 2018 to 2023, using data from the Annual Core Data Surveys conducted by the Kenya Education Network (KENET), with participation rates ranging from 53% to 85%. The study uses a mix of methods, including basic statistics and tests, to examine four key areas of innovation: internet access and cost, the effectiveness of Enterprise Resource Planning (ERP) systems, cybersecurity and disaster recovery, and compliance with data protection laws.

The results show a significant increase in university bandwidth capacity from 40.5 to 52.3 Mb/s per 1,000 users, which is a meaningful change ($p < 0.01$), but tertiary colleges did not experience any notable ERP deployment stagnation (ANOVA, $p = 0.08$), with only 57% of universities and 55% of tertiary institutions achieving full integration by 2023. Cybersecurity preparedness remains critically low, with disaster recovery systems in place in only 20% of universities and 7% of tertiary colleges. The percentages of people who have formally registered under Kenya's Data Protection Act are 22.7% and 7.8%, respectively. These findings suggest that infrastructure growth is outpacing the capacity for governance and institutional integration, constraining

the maturity of Kenya's digital innovation ecosystem. The study proposes a Kenya-specific ICT Innovation Readiness Framework to support policy alignment, strengthen digital public infrastructure, and enhance regional STI competitiveness.

Keywords: ICT e-Readiness, Digital Innovation Systems, Higher Education Digital Transformation, Cybersecurity and Data Governance, National Innovation Capacity (Kenya).



Democratizing Animation: AI-Driven Pipeline Optimization in Emerging Creative Markets

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Abstract

The animation sector in emerging regional markets is undergoing a significant transformation driven by increasing demand for localized content. Traditional production cycles remain resource-heavy and require significant capital alongside labour-intensive manual workflows. This study investigates the integration of artificial intelligence to democratize the animation pipeline in Kenya. It focuses on how regional studios can leverage automation to produce high-quality content at a fraction of traditional costs. The research employs a multi-site qualitative case study design grounded in an interpretivist approach. Data collection involved targeted semi-structured interviews and online questionnaires administered to 57 professional members of the Association of Animation Artistes of Kenya. This methodology establishes a clear industry baseline and captures complex social processes regarding technology adoption.

The findings reveal measurable productivity indicators across the local production pipeline. Exactly 70% of participants currently utilize text-based artificial intelligence tools to streamline workflows. Furthermore 45% of respondents report using these intelligent systems specifically for rapid concept ideation. Practitioners identify high software costs as their primary barrier to production. Artificial intelligence integration directly addresses this economic barrier by reducing production costs and eliminating slow repetitive tasks. These findings culminate in a strategic hybrid framework designed to serve as a benchmark for local industry players. This framework provides actionable insights into navigating the transition from legacy processes to automated workflows. The democratization of these technical processes lowers the barrier to entry for new artists. This shift positions the regional industry as a highly efficient and tech-forward hub for the next generation of global storytelling.

Keywords: Democratisation, The Animation Pipeline, Artificial intelligence, Creative Economy.



Ethical AI Governance in Resource-Constrained Higher Education. A case of Kabale University framework

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Abstract

The rapid uptake of Artificial Intelligence (AI) in East African universities promises major advances in teaching, learning, research, and administration, but introduces serious ethical, equity, and regulatory risks in resource-limited settings. This paper showcases Kabale University's Artificial Intelligence Policy and Academic C Administrative Guidelines, developed and piloted since 2025, as a replicable governance model for low- and middle-income higher education institutions. Co-designed through participatory workshops involving students, faculty, administrators, local community leaders, and the Directorate of ICT, the policy aligns with Uganda's Data Protection and Privacy Act 2019 (2025 enforcement guidelines), UNESCO's Recommendation on the Ethics of AI (2021, updated 2025 toolkit), OECD AI Principles (2024), the EU Artificial Intelligence Act (Regulation (EU) 2024/1689), and the African Union Continental AI Strategy (2024–2030). The framework introduces a four-tier risk classification (Prohibited, High-Risk, Limited-Risk, Minimal-Risk), establishes a multidisciplinary AI Ethics Committee with student representation, mandates pre-deployment risk assessments for high-risk applications (e.g., automated grading, admissions shortlisting), and enforces human-in-the-loop oversight for critical decisions. In academic contexts, it actively encourages responsible AI use in presentations, sit-down tests, projects, conference papers, and publications to strengthen skills development, while strictly prohibiting misuse that undermines academic integrity and capping AI-generated content at 25% of any submission unless expressly authorised and disclosed. Kabale University efforts have yielded measurable improvements, including a 35% increase in reported ethical compliance among faculty and students, a 40% reduction in identified biases in deployed AI tools through mandatory assessments, and over 60% adoption of responsible AI applications such as AI-supported peer review workflows and personalised tutoring. These innovations have enhanced educational outcomes without disadvantaging rural or low-resource students, as evidenced by sustained or improved performance equity metrics in pilot cohorts. The paper details the inclusive design process, emerging operational lessons including resource-efficient monitoring mechanisms and concrete recommendations for scaling responsible AI governance across the East African Community, ensuring innovation coexists with academic integrity, data privacy, and inclusivity in constrained environments.

Key words: AI ethics, governance, higher education, resource-constrained universities, risk-based regulation.



Teacher Support and professional development Needs that influence Adoption of Artificial Intelligence in the Teaching process at public universities. A case of Teaching staff at Makerere University Business school Uganda

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Abstract

This study focused on the Teacher support and Professional Development Needs that influence Adoption of Artificial Intelligence in the Teaching process at Public Universities in Uganda and the purpose of the study was to examine the teacher support and professional development needs that influence the adoption of artificial intelligence in the teaching process at public universities specifically a case of Makerere University Business school Uganda. The study

related to Unified Theory of Acceptance and Use of Technology. The research design adopted was qualitative research underpinned by interpretivism philosophy. The study population comprised of categories of academic staff scattered at the different campuses, a purposive sampling technique was adopted and the sample size was determined by data saturation which was approximately at the 20th participant. Data were sourced through both face-to face, online semi structured in-depth interviews of between 15 -20 minutes.

The data was analysed using thematic analysis (Braun C Clarke, 2006). The themes were interpreted in relation to the study objectives and existing literature. Results concluded that Teaching staff need support and professional development initiatives to faster adopt Artificial Intelligence in their teaching process. These can be transferred to other public universities in Uganda and similar developing-country institutions because they operate under comparable regulatory frameworks, technological capacity levels, and staff development structures. However, transferability depends on contextual similarity, particularly in ICT infrastructure, institutional AI policy, and professional development support systems. It recommended that there should be hands on workshops, increased investment in infrastructure, integration of Artificial intelligence in professional training like use of grade scopes among others. This aligns with the conference theme 3: AI for Education, Skills Development, and Research Excellence.

Keywords: Teacher support, Professional development, Artificial intelligence, Public Universities, Uganda.



Artificial Intelligence as a Catalyst for Pedagogical Transformation in Higher Education: Case of Academic Staff of the Inter-University Council of East African Member Institutions

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Abstract

Empirical research on the use of artificial intelligence (AI) to improve teaching, learning, and assessment in higher education institutions in East Africa remains limited, despite growing global

interest in AI-enhanced pedagogy. Existing studies in the region have largely focused on access to digital technologies, leaving a gap in understanding how structured AI capacity-building can influence instructional practice among university educators. This study examined a six-week professional development programme on generative AI organized by the Inter-University Council for East Africa (IUCEA). The programme targeted academic staff from East African universities. Participants were drawn from 32 public and private institutions within the eight (8) IUCEA member states. A total of 113 academic staff participated. There were 85 males and 28 females. Participants came from ICT, education, STEM, business, and social sciences disciplines. The programme included six learning modules. It ended with a graded capstone project. Participants applied AI tools in their teaching contexts. Four months after the training, we conducted impact assessment to analyse the impact of the training. Data were collected using online Google Forms. Interviews were also conducted with selected participants. Survey data were analysed using descriptive statistics. Qualitative data were analysed using thematic analysis. Both data sources informed the study findings. Quantitative results showed strong instructional efficiency gains. Most participants reported reduced workload during teaching preparation. Specifically, 91.3% (n = 103) agreed AI saved preparation time. Among them, 69.6% (n =79) strongly agreed. These results highlight AI's value in addressing workload challenges in universities. Thematic analysis revealed clear instructional improvements. Participants demonstrated better instructional design and lesson planning. Learning objectives became clearer and more structured. Lesson sequencing improved across teaching materials. Participants expanded their knowledge of AI tools. Content delivery improved through AI-supported multimedia. Teaching became more interactive and engaging. Assessment practices improved through aligned quizzes and feedback tools. Participants also reported increased teaching confidence. The study concludes that structured AI training supports pedagogical improvement. It also reduces academic workload. These findings support integrating AI training into staff development programmes. The study offers four key recommendations: governments should formulate national AI in education policies and invest in digital infrastructure; higher learning institutions must develop comprehensive AI integration strategies with dedicated budgets; trained academic staff should champion AI through communities of practice and mentorship; and development partners should prioritize funding for sustainable capacity-building initiatives.

Parallel Session 3G – AI for Agriculture & Food Security

Session Moderator: Dr. Margaret Nyawira Lukuyu

Session Rapporteur: Prof. Jaffu Othniel Chilogola

Presentations:

1. AI-Powered Smart Nursery for Elite Coffee Seedling Production: A Hybrid Edge-Cloud Architecture for Agricultural Transformation in Burundi by Alice Ndikumwenayo
2. Market Price Prediction Model for Agricultural Products Using Time Series Analysis: A Context of Coffee in Low Resource Environments by Nakaima Amina
3. Machine Learning Approach for Predicting Rice Production in Tanzania by Integrating Economic and Environmental Factors by Rehema Salum Abdallah
4. AI-Enhanced Climate Monitoring to Optimize Insulated Solar Box Cooker Using Thermal Energy Storage Materials by Dr Casiana Blasius Lwiwa

5. Improving City Resilience with AI-Assisted Adaptive Zoning by Samuel Kamau



AI-Powered Smart Nursery for Elite Coffee Seedling Production: A Hybrid Edge-Cloud Architecture for Agricultural Transformation in Burundi

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Abstract

Coffee production, generating 80% of Burundi's export revenues, faces a critical crisis rooted in degraded plant material and lack of certified seedling sources. Traditional nurseries cannot guarantee the genetic purity and phytosanitary standards required by international markets, perpetuating cycles of low yields (250-300 kg/ha) and disease susceptibility. This research addresses this fundamental bottleneck by designing, developing, and validating an AI-powered smart nursery for mass production of elite coffee seedlings. The innovation lies in a hybrid Edge-Cloud-AI architecture engineered for precision microclimatic control. The system integrates Internet of Things (IoT) sensors based on ESP32 microcontrollers continuously monitoring temperature, humidity, pH, EC, and plant phenotypic data via horticultural LED lighting and Raspberry Pi-based imaging cameras for high-throughput phenotypic data capture. Edge Computing ensures autonomous real-time management of cultivation protocols, light cycles, germination humidity, precision fertigation, functioning offline to maintain optimal growing conditions. When connectivity is available, Cloud-based AI models analyse growth data streams using computer vision (OpenCV) and deep learning (TensorFlow/PyTorch) to detect early stress indicators, predict disease outbreaks like damping-off, optimize cultivation recipes, and ensure complete lot traceability for international certification. Data collection follows a structured protocol in which ESP32 sensor nodes log environmental parameters (temperature, humidity, pH, electrical conductivity) at 5-minute intervals, while Raspberry Pi units simultaneously capture high-resolution seedling images for phenotypic monitoring. Sensor data are pre-processed in Python (pandas, NumPy) through outlier removal and normalisation prior to model ingestion. A reference dataset of certified Bourbon and Mibirizi seedlings, provides ground-truth labels for training computer vision models (YOLOv8 for growth-stage detection, ResNet-50 for disease classification). Environmental time-series are analysed with LSTM networks to forecast microclimatic deviations and trigger anticipatory edge-level interventions. Model performance is evaluated using precision, recall, and F1-score metrics. An intelligent alert system provides real-time notifications for critical environmental deviations, while predictive analytics guide agronomic decision-making. Preliminary results indicate over 60% increase in certifiable first-grade seedling production, 25% reduction in production cycle time, and 50% decrease in seedling mortality and resource consumption (water, nutrients, energy) compared to traditional methods. By creating a validated, economically viable technological model for quality seed multiplication, this research establishes the foundation for sustainable regeneration of Burundi's coffee sector, transforming agricultural cooperatives' access to elite planting material capable of delivering on specialty coffee's promise in the 21st century.

Keywords: Smart Agriculture, Elite Coffee Seedlings, Precision Horticulture, Edge-Cloud Architecture, Agricultural AI.



Market Price Prediction Model for Agricultural Products Using Time Series Analysis: A Context of Coffee in Low Resource Environments

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Abstract

Agricultural price volatility in low-resource environments poses serious challenges for farmers, policymakers, and market actors. This study develops a market price prediction model for Robusta Kiboko coffee in Uganda, showing how data driven forecasting can strengthen decision-making in resource constrained agricultural systems. The study used four forecasting approaches: a seasonal statistical model, its extended version with external factors, a Long Short-Term Memory neural network, and a combined statistical neural model. Historical coffee prices and related climate and economic data (1992 - February 2025) were obtained from national and international sources. The dataset was cleaned, transformed, and divided into training and testing sets.

The statistical models captured linear and seasonal trends, the neural network modelled nonlinear patterns, and accuracy was evaluated using mean absolute error, mean squared error, and root mean squared error. Results show that the Hybrid SARIMA-LSTM model recorded the highest prediction errors (MAE = 1,896.51 UGX; MSE = 4,251,983.30 UGX²; RMSE = 2,062.03 UGX), indicating poor performance. Conversely, the Univariate LSTM model achieved the lowest error values (MAE = 245.61 UGX; MSE = 156,102.61 UGX²; RMSE = 395.10 UGX), demonstrating superior predictive accuracy. These results reveal that standalone LSTM models outperform hybrid alternatives in this context. The findings highlight the importance of context specific model selection for agricultural forecasting in low resource environments. The study contributes to agricultural price prediction literature and offers practical insights for improving price risk management, policy planning, and evidence-based decision-making in Uganda's coffee sector.

Keywords: Coffee price forecasting, predictive analytics, SARIMA, LSTM, SARIMAX, Hybrid prediction models, Time series modeling, Uganda, Agricultural markets.



Machine Learning Approach for Predicting Rice Production in Tanzania by Integrating Economic and Environmental Factors

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Abstract

Background: Rice is a crucial crop in Tanzania, the second most commonly consumed cereal and vital for food security. Accurate prediction of rice production is essential for ensuring sustainable supply and informed agricultural planning. While environmental factors such as weather, soil moisture, and vegetation indices are known to influence yields, the contribution of microeconomic variables has received less attention in predictive studies.

Methods: This study investigates the combined effect of environmental and microeconomic

factors in predicting rice production across 21 regions of mainland Tanzania from 2009 to 2021. Key microeconomic variables, including domestic fuel prices and wholesale rice prices, were integrated with environmental data to develop predictive models using three machine learning algorithms: Random Forest, CatBoost, and Gradient Boosting. Predictive performance was compared to identify the most accurate model.

Results: Integrating microeconomic factors with environmental variables improves prediction accuracy. The Random Forest model outperformed the others, achieving an R^2 of 85.6% (vs 82.1% with environmental factors alone), with RMSE decreasing from 34.6 to 31.1 and MAE from 20.5 to 19.2. CatBoost improved (R^2 from 80.1% to 81.9%; RMSE from 36.46 to 34.75; MAE from 25.82 to 24.6). Gradient Boosting, while less accurate, showed improvement when combining factors (R^2 from 73.4% to 77.2%; RMSE from 42.14 to 38.98).

Conclusion: These findings highlight the value of combining environmental and microeconomic data for accurate rice yield prediction. They also underscore the importance of policies addressing both ecological and economic challenges faced by farmers. Future studies should explore additional microeconomic variables such as fertilizer, seed, and pesticide prices to further enhance model performance and support sustainable rice production in Tanzania.

Keywords: Rice production, Machine learning, Microeconomic factors, Environmental factors, Crop forecasting.



AI-Enhanced Climate Monitoring to Optimize Insulated Solar Box Cooker Using Thermal Energy Storage Materials

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Abstract

This study investigates the innovative use of Artificial intelligence (AI)-enhanced climate monitoring to optimize insulated solar box cooker integrated with thermal energy storage materials. The research was conducted near the Physics Laboratory at Mkwawa University College of Education. The experiments aimed to design a solar box cooker that effectively utilizes locally available materials to minimize heat loss and maximize energy retention. This design is crucial for efficient cooking in off-grid and rural areas that may lack access to clean energy sources. Three thermal energy storage materials were tested: normal salt (NaCl), sand and smooth stones. Rice husk and sawdust were used as insulation materials. The performance of these materials were evaluated through the heat retention capabilities and overall cooking power.

Results showed that sawdust was the superior insulation material, demonstrating slightly better thermal retention capabilities than rice husk, particularly during the later hours of solar exposure, which is important for preparing meals in the evening. Normal salt appeared to be the most effective thermal storage material, showing the highest levels of thermal retention and cooking power. These findings emphasize the significance of selecting the right materials for optimizing solar cooking efficiency. Integrating AI-based climate monitoring aided tracking of real-time environmental conditions and cooker performance. It provided appropriate way to

make informed adjustments for improving efficiency, user experience and making solar cooking more reliable.

This study demonstrates the potential of integrating affordable, locally available materials with AI monitoring techniques to develop sustainable, clean and cost-effective cooking solutions. This approach reduces dependence on traditional fuels and enhances clean energy access in resource-constrained areas.

Keywords: Insulated solar box cooker, Thermal energy storage, Artificial intelligence, Sustainable energy, Clean cooking.



Improving City Resilience with AI-Assisted Adaptive Zoning

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Abstract

Rapid urbanization, climate stress, and population mobility are placing unprecedented pressure on zoning systems in East African cities. While zoning is a central instrument of urban governance, it is typically designed as a static regulatory framework, poorly suited to environments characterized by uncertainty, informality, and recurring shocks. At the same time, applications of artificial intelligence (AI) in smart cities have largely focused on asset monitoring or optimization, with limited attention to how AI can support adaptive governance under stress. This paper introduces an AI-assisted framework for adaptive zoning under stress, conceptualizing zoning as a dynamic control surface for urban resilience rather than a fixed land-use classification. We develop a hybrid modeling approach combining agent-based models with machine learning-enabled scenario exploration to simulate how households, developers, informal settlers, and planning authorities respond to climate, infrastructure, and population shocks under different zoning regimes. Using comparative case studies from five East African cities including Nairobi, Mombasa, Kampala, Dar es Salaam, and Kigali, we integrate open spatial data, population layers, climate hazard proxies, and informality indicators to evaluate the resilience implications of static and AI-assisted adaptive zoning strategies. Model outcomes are assessed using metrics of risk exposure, informal settlement growth, accessibility to services, and infrastructure stress. Rather than automating zoning decisions, the proposed system positions AI as a decision-support tool that expands the policy space available to planners by surfacing trade-offs, failure modes, and context-specific adaptation pathways. The findings demonstrate how adaptive zoning approaches can reduce risk exposure and improve system-level resilience under stress while highlighting governance constraints. While demonstrated in the East African context, this approach to AI-assisted adaptive zoning can be applied to rapidly urbanizing, climate-vulnerable cities globally.

Parallel Session 3H – Innovation & Commercialization of AI Solutions in Agriculture

Session Moderator: Prof. Abdi T. Abdalla

Session Rapporteur: Everlyne Akoth Odero

Presentations:

1. Ground Truth to Digital Intelligence: ML-Powered Soil Monitoring for Food-Secure East Africa by Harriet Ratemo
2. AI-Driven UAV and Deep Learning for Climate-Resilient Coffee Farming in Uganda by Tinah Manduna Mutabazi
3. Leveraging AI to Enhance Market Access and Real-Time Farmer Advisory Services for Agricultural Productivity and Food Security in the East African Community by Brown Gwambene
4. AI reveals how climate change is shrinking optimal land for staple crops and escalating food security risks in Uganda by Dr Rapheal Wangalwa



Ground Truth to Digital Intelligence: ML-Powered Soil Monitoring for Food-Secure East Africa

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Abstract

Across East Africa, where 70% of livelihoods hinge on rain-fed agriculture, soil degradation silently erodes the foundation of food security. This study presents a Machine Learning (ML)-based soil fertility monitoring model developed and validated across 1,000 smallholder farms in Busia County, Kenya. The model demonstrates how ML can transform soil science into actionable farmer intelligence. The framework employed stratified random sampling across seven sub-counties to capture spatial variability in pH, organic carbon, nitrogen, phosphorus, and potassium among other soil components. Laboratory analyses adhered to FAO standards using spectrophotometry and atomic absorption spectrophotometry, while digital integration through mobile platforms enabled real-time spatial mapping and reduced data collection errors. Python-based machine learning algorithms processed physicochemical data to generate predictive soil fertility classification and site-specific recommendations to the farmer. Findings exposed a soil health crisis: 65% of farms exhibited problematic acidity (pH 4.5–5.5), and 78% showed critical phosphorus deficiency.

Significant sub-county variations emerged, with Matayos experiencing severe acidity (70% below pH 5.5) while Bunyala maintained near-neutral conditions supporting diverse crop production. The ML system translated these complex datasets into individualized farmer reports specifying lime application rates and nutrient-specific fertilizer formulations calibrated to each farm's deficits. Critically, this ML approach prioritized transparency, the farmer, and indigenous knowledge integration, ensuring technology serves rather than displaces local expertise. The framework demonstrates that ethically designed ML can bridge the precision agriculture gap facing resource-constrained farmers, offering a replicable model for scaling intelligent soil

monitoring across the region. This work directly advances SDG 2 (Zero Hunger) and embodies the East African Community's vision for human-centred agricultural innovation.

Keywords: Machine Learning, Soil Fertility Monitoring, Precision Agriculture, Food Security.



AI-Driven UAV and Deep Learning for Climate-Resilient Coffee Farming in Uganda

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Abstract

Uganda is the second-largest coffee exporter in Africa and contributes approximately three percent of global Arabica and Robusta coffee production, making coffee a strategic pillar for livelihoods, foreign exchange earnings, and food security. However, climate change—manifested through rising temperatures, erratic rainfall, increased pest and disease pressure, and soil erosion—poses a growing threat to both the quantity and quality of coffee yields. This study investigates the application of Artificial Intelligence (AI) integrated with Unmanned Aerial Vehicle (UAV) remote sensing to enhance climate-resilient, data-driven coffee production and institutional crop monitoring in Uganda. The research was conducted on a 44-hectare Robusta coffee farm in Mukono District using high-resolution RGB and multispectral drone imagery. Orthomosaics, Digital Terrain Models (DTM), slope maps, and Normalized Difference Vegetation Index (NDVI) layers were generated to assess crop health, terrain-related risks, and spatial variability. A Mask R-CNN deep learning model implemented in ArcGIS Pro was trained to automatically detect and classify coffee stands, including intercropped systems with banana plantations.

The model successfully identified over 7,000 coffee trees, enabling accurate crop inventory, spatially explicit health classification, erosion and flood risk assessment, and section-based yield projection. Results demonstrate that AI-enabled geospatial analytics provide a rapid, non-destructive, and scalable approach to early warning, precision management, and harvest forecasting compared to conventional manual field assessments. The approach also supports institutional decision-making by addressing persistent data gaps in production statistics, risk assessment, and extension planning. The study shows that AI-driven UAV monitoring can improve farm-level management, optimize resource allocation, strengthen financial and policy decision support, and ultimately contribute to climate resilience, export stability, and long-term food security in Uganda and similar smallholder-dominated agricultural systems.

Key words: Coffee, Drones, Harvest estimate predictions, AI geospatial analytic-deep learning model, Crop health.



Leveraging AI to Enhance Market Access and Real-Time Farmer Advisory Services for Agricultural Productivity and Food Security in the East African Community

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Abstract

Agriculture remains central to livelihoods and economic development in the East African

Community (EAC). Yet, farmers continue to face persistent challenges, including limited market information, fluctuating commodity prices, climate-related uncertainties, and inadequate access to timely advisory services. Artificial Intelligence (AI) offers transformative potential to address these challenges through improving market transparency, enhancing decision-making, and supporting climate-resilient production systems. To realize these benefits, regional coordination and supportive policies are essential to foster AI integration. Although emerging digital platforms and mobile-based advisory tools have begun to demonstrate impact in parts of the region, significant gaps remain in integrating AI-driven analytics, farmer-centred design, and context-specific advisory models. The study aims to examine the role of AI in strengthening market access and real-time advisory services to enhance agricultural productivity and food security. Using a mixed-methods approach that synthesises evidence from empirical studies, case-based analyses, and regional policy frameworks, the study reviews current AI applications in price prediction, demand forecasting, crop advisory, remote sensing, and supply chain optimisation. Key findings indicate that AI-powered platforms significantly improve farmers' capacity, reduce information asymmetry, and enhance the accuracy of agronomic recommendations. These systems also contribute to reduced post-harvest losses, improved climate-smart decision-making, and greater integration of smallholder farmers into formal value chains. However, challenges such as digital inequality, limited ICT infrastructure, fragmented data ecosystems, low AI literacy, and affordability constraints continue to undermine widespread adoption. The study advocates for strengthened regional coordination, inclusive data governance frameworks, investment in rural connectivity, and capacity-building programs that empower farmers, extension officers, and agri-Small and Medium Enterprises (SMEs) to use AI tools effectively. It recommends co-designing advisory systems that integrate local knowledge, gender-responsive approaches, and locally relevant content to ensure equitable benefits. AI presents a substantial opportunity to transform agricultural systems by improving market access and enabling real-time advisory services, thereby contributing to higher productivity, reduced vulnerabilities, and enhanced food security. This study provides evidence that informs policy, innovation ecosystems, and scalable AI solutions tailored to East Africa's agricultural realities.

Key words: Artificial intelligence, Market access, Farmer advisory services, Agricultural productivity, Food security, AI-enabled decision support.



AI reveals how climate change is shrinking optimal land for staple crops and escalating food security risks in Uganda

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Abstract

Background: Climate change is actively reshaping the agricultural landscape of food-insecure regions. To guide a climate resilient East African Community (EAC), we demonstrate how artificial intelligence (AI) can generate critical, spatially explicit intelligence for adaptation planning. This study employs AI approaches through an ensemble machine learning framework to model current and future climate suitability for maize and cassava, the foundational staples of Uganda and the region under four climate scenarios of Shared Socioeconomic Pathways (SSPs).

Results: Our high-resolution, AI-driven analysis reveals a systematic, emissions-dependent loss of optimal growing zones. By the end of century, under a high-emissions climate scenario (SSP5-8.5), optimal land for maize plummets by over 60%, while cassava experiences a 40% loss of its optimal land. This critical attrition is spatially divergent, breaking apart current production heartlands (e.g. Acholi and Bunyoro) while identifying discrete bioclimatic refugia in sub-regions like Lango and Teso. The results indicate that cassava performs better than maize up to mid-century, but even its drought tolerance cannot withstand extreme warming (SSP5-8.5), where top-suitability areas nearly disappear. These geographic shifts signify a profound threat to regional/national food security, displacing production and intensifying vulnerability. **Conclusion and Policy direction:** These findings call for an immediate shift in adaptation policy, from uniform regional/national plans to spatially targeted interventions that strengthen climate-resilient refugia through climate-smart agriculture and support planned livelihood transitions in areas becoming non-viable. The sharp contrast in outcomes between low- and high-emission futures underscores that stringent global climate mitigation is the most effective long-term strategy for preserving agricultural capacity. Ultimately, this research underscores that AI is not just an analytical tool but a visionary partner. It directly links climate science to actionable policy, empowering the EAC to proactively steward its agricultural geography.

Keywords: AI, Machine learning, Climate adaptation, Maize, Cassava, Food systems.

Parallel Session 31 – AI for Health, Wellbeing & Biomedical Innovation

Session Moderator: Dr Kijakazi Obed Mashoto

Session Rapporteur: Prof. François Niyonzima Niyongabo

Presentations:

1. CaviScope: AI-Community-Centric Innovation for Expanding Access to Early Cervical Cancer Screening in Uganda by Solomon Piwun BME
2. Uganda Cancer Care Super App (UCCA): An AI Enabled Digital Cancer Care Ecosystem for improved treatment Access and Continuity by Samuel James Kibanga
3. A human-in-the-loop explainable ensemble machine learning framework for adaptive and

trust-aware severe malaria prediction by Solimo Rajab

4. Few-Shot Sign Language Recognition Using CLIP's Contrastive Multimodal Framework for Healthcare by Japhari Muna Mbaru
5. Leveraging Machine Learning for Enhanced Spatiotemporal Forecasting of Malaria Mortality in Children Under Five in the Democratic Republic of Congo by Aymar Akilimali



CaviScope: AI-Community-Centric Innovation for Expanding Access to Early Cervical Cancer Screening in Uganda

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Abstract

Introduction: CaviScope is a solar-powered, AI-enabled portable cervical imaging device developed to expand access to early cervical cancer screening in remote and underserved communities in Uganda. By integrating real-time AI-assisted imaging with solar-powered portability, CaviScope enables trained health workers to conduct community-based screening outside conventional hospital settings, addressing critical gaps in access, infrastructure, and early detection.

Methods: The study involved the design and development of an AI- and solar-powered portable CaviScope imaging device, followed by targeted training of local health workers to operate the system and interpret AI-assisted outputs. The device was deployed in remote communities to conduct cervical cancer screening. Screening data were collected to assess image quality, AI detection performance, and community acceptance. Continuous feedback from health workers and community members guided iterative refinement of the device and screening workflow.

Results: Early findings demonstrate strong technical and operational performance. Eighty-eight percent of captured images were rated clinically acceptable, with a contrast-to-noise ratio (CNR) of 42.8 ± 5.3 , indicating consistent illumination and minimal shadowing. AI-assisted imaging reliably detected abnormal cervical cells. Community engagement was high, with health workers successfully conducting screenings, providing education, and increasing awareness and uptake of services in remote areas.

Conclusion: CaviScope is a feasible, community-centric solution for decentralizing cervical cancer screening in low-resource settings. By improving accessibility and supporting frontline health workers with clinically acceptable imaging, it has strong potential to reduce late-stage diagnosis and cervical cancer-related mortality. Further validation and scale-up could enhance its public health impact.



Uganda Cancer Care Super App (UCCA): An AI Enabled Digital Cancer Care Ecosystem for improved treatment Access and Continuity

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Abstract

Background: Cancer is a growing public health burden in Uganda and the second leading cause of death after cardiovascular diseases. In 2022, Uganda recorded over 35,968 new cancer cases and 24,629 deaths, with incidence projected to increase by 138% by 2040 according to the International Agency for Research on Cancer. Access to timely cancer care remains limited, particularly for rural populations, who comprise 78.6% of the 45.9 million population and face long travel distances, high costs, late-stage presentation (Stage III – Stage IV), fragmented referrals, and frequent oncology drug shortages.

Objective: To present the Uganda Cancer Care Super App (UCCA), an integrated digital health solution designed to improve early detection, access, coordination, and continuity of cancer care.

Innovation: UCCA integrates artificial intelligence (AI), tele-oncology, and digital health infrastructure into a single platform. Core components include an AI-powered symptom checker and risk stratification tool (mobile, web, and USSD), remote oncology consultations, a patient-owned digital cancer treatment passport, real-time oncology drug availability and stock prediction, and integrated appointment, referral, transport, psychosocial support services. All AI components operate under a human-in-the-loop framework to ensure clinical oversight, fairness, and ethical compliance.

Expected Results: UCCA is expected to enable earlier detection and referrals (30–40%), reduce unnecessary travel (40–50%), lower preventable cancer deaths (by 25%), reduce missed appointments and treatment abandonment, decrease oncology drug stock-outs (20–30%), and strengthen national cancer data systems.

Conclusion: UCCA demonstrates how context-aware, ethically governed AI can strengthen cancer care delivery and health equity in Uganda and the wider East African region.

Keywords: Artificial intelligence for health, Clinical decision support systems, Digital health infrastructure, Cancer care delivery, Health equity in East Africa



A human-in-the-loop explainable ensemble machine learning framework for adaptive and trust-aware severe malaria prediction

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Abstract

Severe malaria continues to contribute to high morbidity and mortality rates in sub-Saharan Africa, where effective identification of high-risk patients is constrained by limited healthcare resources. Machine learning has shown promise in supporting malaria severity prediction, yet most existing approaches operate as opaque offering limited transparency, adaptability, and mechanisms for clinician oversight. This study presents a Human-in-the-Loop explainable ensemble machine learning framework designed to move beyond prediction alone, toward adaptive, transparent, and trust-aware prediction of severe malaria. The framework integrates stacking ensemble learning model with post-hoc SHAP and LIME explainability techniques to generate transparent explanations of the model outcome. A human-in-the-loop interaction layer is introduced for expert iterative feedback that inform post-training adaptive refinement aimed at improving transparency and model trustworthiness rather than direct model retraining. A drift monitoring mechanism is integrated to track shifts in feature importance over time for reliability.

The framework was developed and evaluated using a publicly available dataset comprising 2,206 patient records.

14 individual classifiers were initially evaluated from which 11 models with mean cross-validation scores above 0.80 were selected to build an ensemble system. The study employed a stacking ensemble model to integrate the strengths of high-performing base learners achieving an accuracy, precision, recall, F1-score of 0.83, and ROC-AUC (one-vs-rest) score of 0.93. Stacking model on cross-validation demonstrated strong performance achieving a mean score of 0.78, a std score of 0.03, and an inference time of 0.33 seconds. Post-Hoc explainability techniques consistently identified mean_platelet_vl, platelet_distr_width, hematocrit, platelet_count, hb_level, temperature, red blood cell count and fever_symptoms as the dominant influential predictors of severe malaria. Integrating explainability and human input within unified framework of adaptive ensemble learning modeling adds to the growing discussion on responsible AI toward clinically validated, trust-aware decision-support systems for healthcare settings.

Keywords: Human-in-the-Loop AI; Explainable Artificial Intelligence; Ensemble Machine Learning; Severe Malaria Prediction; Trust-Aware, Stacking Ensemble Model.



Few-Shot Sign Language Recognition Using CLIP's Contrastive Multimodal Framework for Healthcare

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Abstract

Sign-language recognition remains a challenging endeavour because of the scarcity of annotated datasets, particularly for under-resourced languages. Traditional deep learning models struggle to generalize effectively in data-constrained environments. We propose a novel few-shot sign-language recognition framework that leverages pretrained CLIP multimodal embeddings through hybrid prototype construction and episodic fine-tuning. Our approach combines visual and textual modalities using weighted averaging to form class prototypes from both frame-level image features and semantic prompts, thereby enabling robust classification under data-scarce conditions. We evaluated the TSL-100 dataset under a 5-way 1-shot episodic learning framework and obtained a mean classification accuracy of 97.63%, surpassing the performance of both the standard Prototypical Network and a prompt-tuned CLIP baseline. This study demonstrates how the capabilities of CLIP have introduced a breakthrough in few-shot learning, enabling the development of effective sign-language recognition systems using small-scale datasets. This framework facilitates accessible, scalable, and real-time communication solutions in healthcare environments, supporting better patient-provider interactions and improving health outcomes for hearing-impaired patients.

Keywords: Sign Language Recognition, Few-Shot Learning, CLIP, Contrastive Learning, Multimodal Learning.



Leveraging Machine Learning for Enhanced Spatiotemporal Forecasting of Malaria Mortality in Children Under Five in the Democratic Republic of Congo

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Abstract

Background: Malaria remains a major public health challenge in the Democratic Republic of Congo (DRC), particularly affecting children under five years of age. Accurate and timely spatiotemporal forecasts of malaria mortality are critical for optimizing resource allocation and implementing effective control strategies. Methods: This study developed and evaluated two machine learning (ML) models, Random Forest and XGBoost, to forecast monthly provincial-level malaria mortality in children under five across the DRC. Monthly mortality data from 2020 to 2023 were used for extensive spatio-temporal feature engineering, incorporating lagged mortality values, rolling means, and cyclical seasonal components. Model performance was assessed using Root Mean Squared Error (RMSE) and Mean Absolute Error (MAE). Results: Both ML models demonstrated strong predictive capabilities on the training data, with XGBoost slightly outperforming Random Forest (RMSE: 8.97 vs. 10.25; MAE: 5.92 vs. 6.88).

Feature importance analysis identified lagged mortality, provincial identifiers, and seasonal indicators as the most influential predictors. Forecasts for 2024 revealed persistently high-burden provinces, such as Kongo-Central and Maniema, with strong seasonal peaks between October and December. Mann-Kendall trend tests indicated significant increasing mortality trends in provinces like Tshuapa and Lualaba, whereas Haut-Katanga exhibited a decreasing trend. Conclusion: These findings highlight the potential of ML models to provide accurate and granular spatio-temporal forecasts of malaria mortality. Such predictive insights are invaluable for optimizing resource allocation, strengthening early warning systems, and guiding targeted public health interventions in the DRC. The proposed framework also offers a transferable methodology for improving disease surveillance and response in other high-burden settings.

Keywords: Children Under Five; Democratic Republic of Congo; Machine Learning; Malaria; Malaria Mortality; Spatiotemporal Forecasting



DAY THREE

On the third and final day of the conference, the eighth Plenary Session tackled the theme, “Women and Youth Innovation & Entrepreneurship – Pitches & Demonstrations.” The ninth Plenary Session had the theme, “Powering AI with East African Data, Local Content and Languages,” while the tenth Plenary Session focused on the theme, “Young Innovators at the Forefront of Africa’s AI Transformation”.

Two Side Events were held on the third day:

- UNESCO Capacity building for policy makers; and
- Strengthening Africa’s Voice in Global AI Governance—African Advanced Level Telecommunications Institute (AFRALTI) and British High Commission

The Ministerial Session constituted the eleventh Plenary Session and was also held on the final day of the conference, during which a report was given on the implementation of the resolutions of the 3rd EAC Regional STI Conference held in Nairobi, Kenya, in 2024. This was followed by the presentation of the EAC Declaration on Artificial Intelligence, which the ministerial session adopted.

Two strategy documents were launched:

1. The East African Regional Space Science and Technology Strategy, 2023-2028. The strategy aims to establish and integrate space strategy in East Africa.
2. EAC Strategy on Innovation In Informal Industrial Cluster.

PLENARY SESSION 8

Women and Youth Innovation & Entrepreneurship Pitches & Demonstrations

Preamble

AI is opening new pathways for enterprise growth, productivity gains, and economic transformation across East Africa. However, unlocking this potential requires stronger investment ecosystems that can support AI innovation from ideation to scale. Startups, research institutions, innovation hubs, and emerging technology ventures need access to patient capital, venture financing, catalytic grants, corporate partnerships, and enabling financial infrastructure to move from experimentation to commercially viable and impactful solutions.

For East Africa, investment in AI is not only about financing technology companies; it is about building the foundations for a competitive regional digital economy. This includes investing in talent, research commercialization, startup incubation, digital public infrastructure, and mechanisms that de-risk innovation in priority sectors such as finance, health, education, agriculture, trade, and climate resilience. Regional financial centres, venture builders, universities, and development finance actors all have an important role to play in shaping an ecosystem where African AI entrepreneurs can build, attract capital, and scale solutions across borders.



Keynote Presentation: Dr. James Mwangi, Group Managing Director and CEO, Equity Group Holdings

Title of Presentation: Supporting Youth and Women AI Innovators and Entrepreneurs (Finance, Incubation & Policy)

Session Moderator: Dr. Fortunate Muyambi, DES, EASTECO

Session Rapporteur: Jean Louis Niragire

Keynote Presentation

The keynote address was delivered by Johnny Falla, speaking on behalf of Dr. James Mwangi, Group Chief Executive Officer of Equity Group Holdings. He presented a forward-looking vision for inclusive, AI-driven development in East Africa. The speech centred on empowering women and youth through expanded access to finance, skills development, incubation ecosystems, and supportive policy frameworks, within the broader theme of harnessing responsible artificial intelligence for regional transformation.

The address emphasised that the region must move beyond financial inclusion alone toward “impact-driven development,” where access to finance translates into tangible improvements in livelihoods, enterprise growth, and community resilience. It highlighted the need for private sector-led development finance to serve as a catalyst for innovation and transformation, particularly in a context of global economic volatility, climate shocks, and shifting geopolitical and trade dynamics.

A key message was the importance of institutional self-transformation. Equity Group Holdings, as described in the speech, is actively “disrupting itself” through large-scale internal upskilling initiatives, including mandatory training in generative AI for all employees and structured academic advancement programmes. These efforts are designed to ensure that leadership and

staff at all levels are equipped for the digital and AI-driven economy.

The keynote outlined extensive partnerships aimed at scaling digital skills across the region. These include collaborations with WorldQuant University, Cisco Networking Academy, Huawei ICT Academy, and iamtheCODE Foundation, alongside innovation ecosystem support through UNDP timbuktoo and an EdTech challenge fund in partnership with the XPRIZE Foundation. The speech also referenced regional coordination efforts through the EAC AI Alliance, supported by GIZ, and engagement with East African Science and Technology Commission and Inter-University Council for East Africa.

Rwanda was identified as a key hub for Africa's emerging AI ecosystem, with proposed areas of collaboration including AI incubation centres for solving challenges in health, education, energy, and agriculture, leadership training in AI readiness, and the establishment of university-based invention centres to nurture talent. The address also highlighted emerging exploration of virtual assets to facilitate cross-border trade and strengthen implementation of the African Continental Free Trade Area, as well as investment in digital public infrastructure to ensure citizens retain ownership and control of their digital identities.

In conclusion, the keynote called on governments, academia, and the private sector to act decisively to ensure Africa not only participates in the global AI transformation but leads it. It stressed that empowering women and youth with finance, skills, infrastructure, and enabling policy environments is essential to building an inclusive and innovative East African digital economy.

EAC Youth & Women Innovation & Entrepreneurship Challenge (COYWA Programme) Innovation Pitches

Sixteen innovation pitches from East African countries received recognition, as detailed in Table 1.



Table 1: COYWA Innovation Pitches Across East Africa

S/No.	Name	Country	Innovation Title	Core Problem Solved	AI Application	Audience/ Panel Response
1	Joseph Bantunge	Burundi	TRANS-ECO biodegradable packaging	Agricultural waste & plastic pollution	Not explicit	Strong interest in circular economy
2	Kevin Niyonkuru	Burundi	Sweet potato value addition	Post-harvest losses & malnutrition	Not explicit	Positive on nutrition, and farmer linkage
3	Victor Muzamba	DRC	Decentralized methanization systems	Waste management & energy poverty	Not explicit	Interest in climate, and energy solution
4	Philippe Koko	DRC	PATA Juice	Unhealthy beverages & post-harvest loss	Not explicit	Appreciation for local value addition
5	Judy Mwendu Mutunga	Kenya	Ustawi Foods	Vitamin A deficiency & food loss	Not explicit	Strong engagement on nutrition impact
6	Dennis Taban Okeny	Kenya (refugee)	Kakuma Eco-Bag	Youth unemployment & plastic waste	Not explicit	Noted inclusion of refugee innovation
7	Yvan (Amazing Insect)	Rwanda	Insect-based waste conversion	Organic waste & fertilizer shortage	Bioconversion (not AI)	Interest in sustainability
8	Enock Abayisinga	Rwanda	BEYI Rice Transplanter	Manual farming inefficiency	Not explicit	High interest in mechanization
9	Mohamed Abdulkadir	Somalia	Greenlife Co-copeat	Soil degradation & costly inputs	Not explicit	Strong climate-smart relevance
10	Ayan Abdirahman	Somalia	Goodlight Solar	Energy access & affordability	Monitoring systems (AI-lite)	Strong engagement on scalability
11	Malish Simon Modi	South Sudan	Sesame oil processing	Lack of value addition & imports	Not explicit	Interest in agribusiness scaling
12	Mark Leon	South Sudan	Plan B Recycle	Plastic waste & housing shortage	Not explicit	Highly impactful circular economy
13	Regina Mushi	Tanzania	Plant Natural Feed	Soil fertility decline	Not explicit	Interest in climate-smart inputs
14	Luqman Juma	Tanzania	Agri-processing machines	Manual labor & post-harvest loss	Not explicit	Strong relevance to SMEs
15	Hellen Munyasa	Uganda	Helton Eco-Threads	Plastic waste & import dependence	AI in material grading	Very strong interest (AI element)
16	Esther Nafula	Uganda	QuickBeans	Long cooking time & energy use	Not explicit	Very strong engagement (clear value proposition)

KEY POINTS AND EMERGING ISSUES

The session recommended a comprehensive set of measures aimed at strengthening innovation ecosystems and enabling inclusive enterprise growth across East Africa, with a particular focus on women, youth, and vulnerable groups.

Participants emphasised the urgent need to expand access to early-stage and seed financing, noting that limited capital remains a major barrier for youth- and women-led startups. This was linked to a broader call for more responsive financial instruments and investment mechanisms tailored to emerging enterprises.

The session further highlighted the importance of strengthening regional incubation and acceleration hubs in key innovation centres such as Kigali and Kampala. These hubs were seen as critical platforms for nurturing startups, providing mentorship, and connecting innovators to markets and investors.

To support business growth, participants underscored the need to promote market access through deeper regional integration and the use of trade platforms. This would enable startups to scale beyond national borders and take advantage of the wider East African market.

Capacity building emerged as another key priority, with recommendations to invest in training programmes that combine business development skills with emerging competencies in artificial intelligence and digital technologies. Such efforts were viewed as essential for preparing entrepreneurs to compete in a rapidly evolving digital economy.

The session also called for stronger public-private partnerships to mobilise resources, share expertise, and scale innovation ecosystems more effectively. Collaboration between governments, industry, and development partners was identified as a cornerstone for sustainable impact.

In addition, participants stressed the need for inclusive policy frameworks that deliberately target women, youth, and refugee entrepreneurs, ensuring that innovation systems do not exclude marginalised groups.

Sustainability considerations featured prominently, with recommendations to increase investment in climate-smart solutions and circular economy innovations, particularly in sectors such as agriculture, energy, and waste management.

Finally, the session emphasised the importance of facilitating the adoption of technology—including artificial intelligence and digital tools—to help enterprises improve productivity, expand market reach, and scale efficiently across the region.

Side Event 5: UNESCO Capacity building for policy makers

Side Event 6: Strengthening Africa's Voice in Global AI Governance - African Advanced Level Telecommunications Institute (AFRALTI) and British High Commission

Session Overview

Artificial Intelligence (AI) is rapidly shaping global economic competitiveness, public service delivery, security, and diplomacy. Across Africa, momentum on AI governance is gradually growing, with several countries developing national AI strategies and regulatory frameworks. At the continental level, the African Union (AU) has adopted a Continental Artificial Intelligence Strategy, that sees AI as a key enabler for achieving Agenda 2063 and the Sustainable Development Goals (SDGs). Despite this progress, Africa's AI governance landscape remains fragmented. National strategies are emerging at different speeds, often without sufficient coordination, shared learning, or alignment across countries. Multistakeholder engagement remains limited, and policymakers frequently lack structured opportunities to exchange practical experiences, align positions, and develop shared policy tools—particularly in preparation for global AI governance processes.

Objectives of the Side Event on AI Governance

The overall objective of the Side Event is to strengthen coordinated, inclusive, and informed AI governance across Africa through structured multi-stakeholder dialogue, knowledge exchange, and coalition building.

The specific objectives of the side event are:

1. To highlight Africa's emerging leadership in responsible AI governance.
2. To discuss opportunities for stronger continental coordination in AI governance frameworks.
3. To introduce and form an informal Working Group on AI Governance in Africa.
4. To strengthen partnerships between African institutions and other global partners.

Discussion Themes

The side event focused on strategic mechanisms of enabling AI to be designed, deployed, regulated and monitored responsibly for the benefit of African economies while strengthening capacity and coalitions with the other partners such as the UK Science, Research, Technology and Innovation (STRI). The major themes highlighted were:

1. Responsible AI and Ethics.
2. AI Governance and Regulation.
3. AI Compute Infrastructure and Data Governance.
4. AI for Sustainable Development.
5. Coordination and Collaboration with existing International frameworks such as WSIS, Global Digital Compact etc.

Follow-up Activities

The event provided a shared platform for preparatory research and stakeholder mapping to identify key actors and institutions across Africa and develop strategies for further engagement as well as develop a 12-month coalition action plan among the various players that are keen to contribute to the growth and adoption of AI on the continent, with the following functions:

- Policy Coordination: Provision of a platform for African policymakers to continually share experiences in developing AI strategies and regulatory frameworks.
- Knowledge Sharing: Development of shared tools such as AI governance toolkits, regulatory

guidance, policy briefs, white papers, etc.

- Capacity Building: Supporting policymakers, legislators, and regulators through training workshops, policy exchanges, research collaboration, etc.
- Global Coordination: Strengthening Africa's voice in global AI governance discussions including OECD, UN Global Digital Compact, Global AI governance forums etc.



PLENARY SESSION 9

Powering AI with East African Data, Local Content and Languages

Preamble

AI models depend on high-quality, relevant data to deliver meaningful impact. For East Africa, accelerating AI adoption requires significant investment in structured datasets that provide meaningful access to locally generated content that reflects the region's economies, cultures, and languages.

Strengthening data ecosystems across agriculture, health, education, finance, climate, and trade will enable the development of AI solutions tailored to local needs, challenges and opportunities. In addition, advancing natural language processing for local East African languages will expand digital inclusion, unlock new markets, and stimulate innovation across economic sectors.

This theme highlights practical pathways for expanding regional data assets, scaling local content production, and building language technologies that drive economic growth, entrepreneurship, and cross-border digital integration within the East African Community.



Keynote Presentation: Audace Niyonkuru, Founder & CEO, Digital Umuganda

Title of Presentation: Unlocking Growth Through Data and Language Technologies: Building AI Systems that reflect East Africa

Session Moderator: Robin Miller, Axum

Session Rapporteur: Benjamin Nabaana

Panelists:

- Dr. Caroline Asiimwe, Executive Secretary, East Africa Kiswahili Commission
- Robert Ford Nkusi, Member, Africa AI Council
- Edward Kayondo, CTO, Mazeta AI, Rwanda
- Dennis Kevogo, Group Chief Data Strategist, Jubilee Holdings Ltd
- Patrick Albert Ipola, Ministry of STI, Uganda

Keynote Presentation

In his keynote presentation, Mr. Audace Niyonkuru highlighted the growing role of artificial intelligence in language technologies, while underscoring the unique linguistic challenges and opportunities within the African context.

The speaker noted that AI-powered tools such as Gemini, Claude, and ChatGPT are increasingly being used for language interpretation and communication. However, it was emphasised that language systems in Africa are complex and cannot be treated in isolation. Key challenges identified included limited availability of structured data, the predominance of oral traditions, linguistic diversity and complexity, lack of standardised writing systems, and constraints within existing AI frameworks.

The presentation further observed that most current AI assistants are not adequately designed for African contexts, as they are trained predominantly on non-African datasets. As a result, the speaker called for the development of open, inclusive datasets specifically focused on African speech and language technologies to improve relevance and performance.

A significant emphasis was placed on Kiswahili, which was recognised as a key indigenous and unifying language within the East African Community. The speaker argued that promoting a shared regional language such as Kiswahili could enhance communication, integration, and collaboration across countries.

The importance of linguistics was particularly highlighted in critical sectors such as healthcare, where effective communication between providers and patients is essential for accurate diagnosis, treatment, and overall service delivery.

Overall, the keynote stressed the urgent need for Africa to advance AI applications in linguistics, positioning language technologies as foundational to inclusive digital transformation. It concluded by reaffirming the strategic importance of investing in language resources, research, and policy support to ensure that AI systems reflect and serve the continent's linguistic realities.

Panel Discussion

The panellists explored a set of strategic questions focused on the role of language in shaping the development and impact of artificial intelligence within East Africa's socio-economic landscape. On the place of language in the regional economy, panellists observed that language is a critical enabler of trade, service delivery, education, and innovation. They emphasised that effective communication—particularly through widely understood languages such as Kiswahili—can enhance regional integration, unlock markets, and support inclusive participation in the digital economy.

In discussing how language models can advance the power of AI, the panel highlighted the importance of developing models that are trained on locally relevant data. They noted that context-aware AI systems, capable of understanding indigenous languages and cultural nuances, are essential for improving accuracy, usability, and adoption across sectors.

The issue of inclusivity was also central to the discussion. Panellists stressed that AI development must be intentional in ensuring that benefits are widely shared, particularly among marginalised groups. This includes designing accessible tools, addressing language barriers, and ensuring that datasets reflect the diversity of African populations.

On policy, the panel underscored the need for forward-looking and harmonised regulatory frameworks that both enable innovation and safeguard ethical standards. Governments were encouraged to create supportive environments for AI development through investment, clear guidelines, and alignment across the region.

Collaboration emerged as a key theme, with panellists calling for stronger partnerships among governments, academia, the private sector, and development organisations. Such collaboration was seen as essential for pooling resources, sharing knowledge, and scaling AI solutions effectively across borders.

Finally, in addressing the question of a common language for advancing the public good, the panel reiterated the importance of adopting shared and inclusive languages—again highlighting Kiswahili—while also preserving linguistic diversity. They concluded that a balanced approach,

combining a common regional language with support for local languages, would be most effective in ensuring that AI-driven solutions serve broad societal interests.

KEY POINTS AND EMERGING ISSUES

The session underscored a set of strategic recommendations aimed at advancing language technologies and strengthening the broader AI ecosystem in East Africa.

A central theme was the need for stronger collaboration between industry and academia. Participants emphasised that closer partnerships between universities, research institutions, and private sector actors are essential to unlock innovation, accelerate research translation, and build practical language technology solutions suited to regional needs.

The session also highlighted the importance of prioritising local investment and value creation. It was noted that for AI systems to meaningfully reflect East African realities, there must be deliberate efforts to mobilise domestic resources, support local enterprises, and retain value within the region rather than relying heavily on external technologies and funding.

In addition, participants called for the establishment of a more conducive environment for research and development. This includes strengthening institutional capacity, improving access to funding, and creating supportive policy and regulatory frameworks that enable experimentation and innovation in AI.

A strong cultural dimension emerged, with recommendations to actively promote and invest in African languages such as Kiswahili. The session stressed that language technologies should not only drive economic growth but also preserve and uphold Africa's cultural identity and heritage.

Infrastructure development was also identified as a priority. Participants proposed the establishment of intelligent laboratories and the localisation of data centres within East Africa to support data processing, storage, and the development of context-relevant AI systems.

Finally, the session reinforced the need for cross-sector collaboration among governments, private sector actors, academia, and development partners. Such coordinated efforts were seen as critical for aligning resources, sharing expertise, and scaling impactful AI and language technology initiatives across the region.



PLENARY SESSION 10

Young Innovators at the Forefront of Africa's AI Transformation

Preamble

Young people are central to East Africa's digital and AI future, serving as key drivers of innovation, entrepreneurship, and locally relevant solutions across sectors such as education, health, agriculture, finance, and climate resilience. While many youth are already developing AI tools and startups, their leadership must be intentionally supported through improved access to education, digital skills, mentorship, funding, research opportunities, and policy engagement. The session will showcase young AI innovators, discuss the challenges they face, and explore how governments, institutions, and ecosystem partners can better support youth-led innovation across the East African Community.



Keynote Presentation: Barbara Glover, Programme Officer, AUDA-NEPAD
Title of Presentation: From Talent to Transformation: Empowering Young Innovators to Lead Africa's AI Future

Session Moderator: Jocelyne Mukamisha, Digital Transformation Centre, Rwanda

Session Rapporteur: Dr. Pancras Ndokoye

Panelists:

- Emmanuel Bandanga Bire, EAC Regional Lead for the Alliance for AI; Zindi Ambassador (Kenya)
- Rose Delilah Gesicho, Data Scientist; Community Manager at Zindi; Chair, Community Committee at Deep Learning Indaba
- Keriane Nzabampema, AI Practitioner, Elantris Consulting Group
- Audace Niyonkuru, Founder & CEO, Digital Umuganda

Keynote Presentation

The keynote presentation, made by way of pre-recorded video, focused on the untapped potential of young innovators in Africa and the systemic barriers that prevent their ideas from translating into real-world impact.

The speaker illustrated this potential through the example of William Kamkwamba, a young boy from Malawi who built a windmill from local materials to generate electricity for his community. This story was used to demonstrate that talent and ingenuity exist widely across the region, particularly among young people, and that such talent can generate practical, transformative solutions when properly supported.

However, the keynote emphasised that despite this abundance of talent, there is a significant gap between innovation and real-world application. Many young innovators lack the necessary support systems, including access to funding, mentorship, infrastructure, and platforms to scale

their ideas. As a result, innovation often remains isolated and underdeveloped.

The speaker highlighted the need to establish robust AI and digital infrastructure as a critical “bridge” to connect talent with opportunity. This includes creating environments where innovators can collaborate, access shared resources, and avoid working in isolation. Strengthening such ecosystems was presented as essential to transforming ideas into viable enterprises.

Youth unemployment was identified as a pressing challenge, compounded by the paradox that many talented young individuals remain undervalued or positioned at the margins of economic systems. The keynote suggested that this disconnect represents a missed opportunity for economic growth and social transformation.

In addressing solutions, the speaker called for deliberate interventions to support young innovators. These include investing in innovation ecosystems, expanding access to finance, building collaborative platforms, and creating inclusive policies that recognise and nurture grassroots talent. The overarching message was that empowering young innovators—through infrastructure, support systems, and recognition—will be key to unlocking Africa’s development potential in the age of AI.

Panel Discussion

The panel discussion examined key challenges and opportunities in advancing community-based AI development, with a particular focus on language datasets, youth pathways into AI, and enabling policy and ecosystem support.

On the development of the Digital Umuganda Kinyarwanda dataset, panellists highlighted several foundational issues. While the dataset is intended to support language modelling and AI applications in Kinyarwanda, its effectiveness is constrained by a lack of standardisation, making it difficult to ensure consistency and interoperability. In addition, there is limited infrastructure for testing and validating AI models, including the absence of dedicated laboratories to assess accuracy and performance. Capturing the full diversity and nuances of the language was also identified as a major challenge, particularly given variations in dialect and usage.

The discussion then turned to pathways for youth engagement in AI. Panellists emphasised the importance of building and joining communities, as well as participating in competitions and innovation platforms that expose young people to practical opportunities. They noted that beyond skills development, there is a need to cultivate leadership among youth who can bridge the gap between underserved communities and emerging opportunities in AI.

Community-led initiatives, such as NDABA and SINDI, were cited as examples of grassroots innovation ecosystems. Their sustainability, however, remains a challenge. While passion and volunteerism were recognised as critical drivers of growth, panellists stressed that consistent funding is necessary to support operations, scale activities, and maintain impact over time.

On the question of bringing AI closer to communities, the panel agreed that awareness and integration are key. Embedding AI concepts into existing programmes and local initiatives was seen as an effective way to demystify the technology and encourage wider participation.

Reflecting on the transition from traditional to AI-based learning, panellists noted that while AI offers significant potential as a problem-solving tool, making these solutions viable and practical remains a challenge. Issues of accessibility, affordability, and real-world applicability continue to limit impact. As such, increased investment in talented young people was identified as essential to bridging this gap.

Finally, the panel addressed policy considerations for promoting young AI innovators. Recommendations included creating more realistic and accessible market opportunities for innovators, fostering direct engagement between policymakers and youth to co-develop solutions, and ensuring greater youth participation in policy formulation processes. Overall, the discussion underscored the need for inclusive, well-supported ecosystems that connect talent, technology, and opportunity.

KEY POINTS AND EMERGING ISSUES

The session highlighted a set of strategic recommendations and key issues focused on strengthening digital ecosystems and creating pathways for talent-driven growth across the economy.

A central recommendation was the integration of scalable digital platforms into public service delivery. Participants emphasised that governments should adopt technology-enabled systems that can reach large populations efficiently, improve service quality, and create opportunities for innovation within the public sector.

The discussion also underscored the need to build systems and marketplaces that actively employ and utilise local talent. Rather than allowing skills to remain underutilised, panellists called for the development of digital and innovation ecosystems that connect skilled individuals—particularly youth—to real economic opportunities, including jobs, contracts, and entrepreneurial ventures.

Laying robust digital infrastructure across the entire economy was identified as a foundational priority. This includes investments in connectivity, data systems, and computing capacity, which are essential for supporting AI adoption, digital services, and innovation at scale.

Another key recommendation was the shift toward outcome-based public procurement. Participants noted that governments should move beyond traditional input-based contracting and instead prioritise measurable results and impact. This approach would create space for innovative solutions, including those developed by startups and young entrepreneurs, to be integrated into public systems.

Finally, the session encouraged benchmarking against successful global and regional initiatives to inform the development of systems that nurture and scale talent. Learning from best practices was seen as critical to designing effective frameworks that enable innovators to grow, compete, and contribute meaningfully to economic development.

Overall, the session emphasised the importance of aligning infrastructure, policy, and market systems to unlock the full potential of talent and drive inclusive digital transformation.

PLENARY SESSION 11: MINISTERIAL SESSION

Ministerial Dialogue: Strengthen Leadership and Policy Coordination for Responsible AI Adoption and Regional Competitiveness in the EAC

Preamble

The Ministerial Session was an important part of the conference that allowed high-level engagement of government policy makers in order for them to fully appreciate the key issues and resolutions of the conference. The ministers and/or their representatives present were informed of the status of implementation of resolutions from the 3rd EAC Regional STI Conference held in Nairobi in 2024. They also issued the EAC Declaration on Artificial Intelligence.

AI is rapidly reshaping governance, economies, and public service delivery across the globe, presenting both transformative opportunities and complex policy challenges. For the East African Community (EAC), accelerating AI readiness is essential to enhance regional competitiveness, improve public sector efficiency, and foster inclusive and sustainable development. Ministers, regulators, and heads of agencies play a critical leadership role in establishing enabling policies, regulatory frameworks, institutional capacity, and cross-border collaboration mechanisms. Strengthening coordinated regional approaches will ensure responsible AI adoption that safeguards public interests, promotes innovation, and supports the EAC's digital transformation and socio-economic integration agenda.

Session Moderator: Hon. Andrea Ariik Malueth, Deputy Secretary General, EAC

Session Rapporteur: Dr. Offoro N. Kimambo

Speakers:

1. Dr. Monica Musenero Masanza, Minister of Science, Technology, and Innovation, Office of the President, Uganda – Keynote Address
2. Hon Beatrice Askul, Cabinet Secretary for the Ministry of East African Community, Arid and Semi-Arid Lands (ASALs), and Regional Development, Kenya
3. Hon. Dr. Usta Kaitesi, Minister of State for Foreign Affairs, Rwanda
4. Hon. Paula Ingabire, Minister of ICT and Innovation, Rwanda
5. Hon. Prof. Adolf Mkenda, Minister of Education, Science and Technology, Tanzania
6. Hon. Ateny Wek Ateny, Minister of Information and Postal Services, South Sudan

Keynote Address:

The keynote address by Monica Musenero Masanza, delivered virtually from the United States, underscored the urgency for the East African Community to decisively embrace artificial intelligence as a driver of economic transformation. She emphasised that AI is no longer optional, but a fundamental factor of production reshaping economies, redefining government functions, and shifting value creation toward digital systems.

Dr. Musenero cautioned that mere adoption of AI technologies is insufficient if the region remains excluded from value creation. She warned that East Africa risks staying at the consumption end of the global digital economy unless it actively produces, owns, and retains AI-driven value. The keynote therefore called for a shift in focus from technological access to economic security and sovereignty in the AI era.

She identified four critical challenges facing the region: fragmented national policies, inadequate digital and computing infrastructure, limited integration and sharing of data, and weak consumer protection frameworks. These constraints, she argued, hinder the region's ability to fully leverage AI for development.

To address these issues, Dr. Musenero proposed five strategic priorities. These include the establishment of a regional AI governance structure—such as an EAC AI Council—and the harmonisation of policies to create a unified digital market. She also called for investment in sovereign cloud and computing infrastructure, the development of a cross-border data exchange framework, and the promotion of homegrown innovation ecosystems supported by locally developed AI models. Additionally, she advocated for the creation of a “Made-in-EAC” AI brand to position the region competitively in global markets through strategic trade partnerships.

Drawing parallels with major regional infrastructure initiatives such as the Standard Gauge Railway and the East African Crude Oil Pipeline, she urged leaders to apply similar ambition and coordination to AI development.

In her concluding remarks, Dr. Musenero called on EAC member states to transition from reliance on foreign-owned digital platforms to building and owning their own AI infrastructure and systems. She cited ongoing efforts in Uganda—including the establishment of AI studios and the modernisation of national datasets—as examples of steps toward digital sovereignty. She stressed that regional collaboration will be decisive in determining whether East Africa captures the economic benefits of AI or continues to export them, concluding that the opportunity is immediate and must not be missed.

Ministerial Panel Discussion

Hon. Prof. Adolf Mkenda - Minister of Education, Science and Technology, Tanzania

The minister agreed with the keynote address by Dr. Musenero and the recommendations made. He agreed with the statement that we should not just be consumers and users but also producers of AI knowledge. He emphasised the need for human capital investment to increase the critical mass of people in East African countries with top skills in technology. He highlighted a specific national initiative in Tanzania focused on identifying talented students early, enrolling them in intensive training programmes, and supporting them through scholarships at leading international institutions. The objective, he noted, is to build a pipeline of highly skilled professionals who can return to drive innovation locally.

Hon. Beatrice Askul - Cabinet Secretary for the Ministry of East African Community, Arid and Semi-Arid Lands (ASALs), and Regional Development, Kenya

Speaking on behalf of Kenya, Hon Askul conveyed the government's appreciation to Rwanda for hosting the conference and reaffirmed that AI is no longer optional but essential for

development. She highlighted tangible applications already underway in Kenya, including AI-driven weather prediction for farmers, real-time cargo scanning, intelligent financial systems, and climate disaster forecasting. While acknowledging the persistence of the digital divide, she emphasised that AI is helping to bridge these gaps. She called for the conference resolutions to move beyond discussion into implementation and reaffirmed Kenya's commitment to translating recommendations into concrete national action.

Ambassador Akuei Bona Malwal - Minister of Foreign Affairs, South Sudan

From South Sudan, the Minister of Foreign Affairs underscored the significance of youth leadership in shaping the AI discourse within the region. He noted that it was particularly encouraging to see young East Africans actively contributing to discussions on emerging technologies. Despite ongoing national challenges, he expressed strong confidence in South Sudan's ability to advance in AI and affirmed the country's commitment to implementing the outcomes of the conference with accountability. His remarks positioned participation not as symbolic, but as a clear signal of intent to act on the insights generated.

Implementation of Ministerial Resolutions from the 3rd STI Conference

A total of 30 resolutions were shared across the EAC partner states, with implementation progressing at varying capacities across member countries. Notable progress has been reported through the East African Science and Technology Commission (EASTECO) and the Inter-University Council for East Africa (IUCEA), which have advanced several key initiatives, including:

1. Capacity building programmes across the region
2. Digital entrepreneurship and innovation training and support
3. Education for Impact programmes developed in partnership with private sector and industry stakeholders
4. Initiation of STEM scholarships for students across the region
5. Establishment of the East African Student Mobility Programme

Further implementation, updates and detailed information will be shared across relevant platforms.



EAC Youth & Women Innovation & Entrepreneurship Challenge Awards

The EAC Youth and Women Innovation & Entrepreneurship Challenge was implemented under the COYWA (Creation of Opportunities for Youth and Women in Africa) programme by the East African Community (EAC), through EASTECO. The initiative formed a key platform for identifying, showcasing, and recognising high-potential women- and youth-led enterprises across the region.

The challenge demonstrated strong regional engagement and participation:

- 110 universities participated
- 3,852 registered participants
- 986 participants reached the final challenge weekend
- 5,126 total submissions were received

These figures reflect the scale of interest and the growing pipeline of innovation and entrepreneurship talent across the region.

Participants were drawn from all eight EAC Partner States, with a focus on women and youth entrepreneurs, startups, and MSMEs.

Innovations were evaluated based on:

- Relevance to regional development challenges
- Innovation and originality
- Scalability and sustainability
- Potential for job creation and economic impact

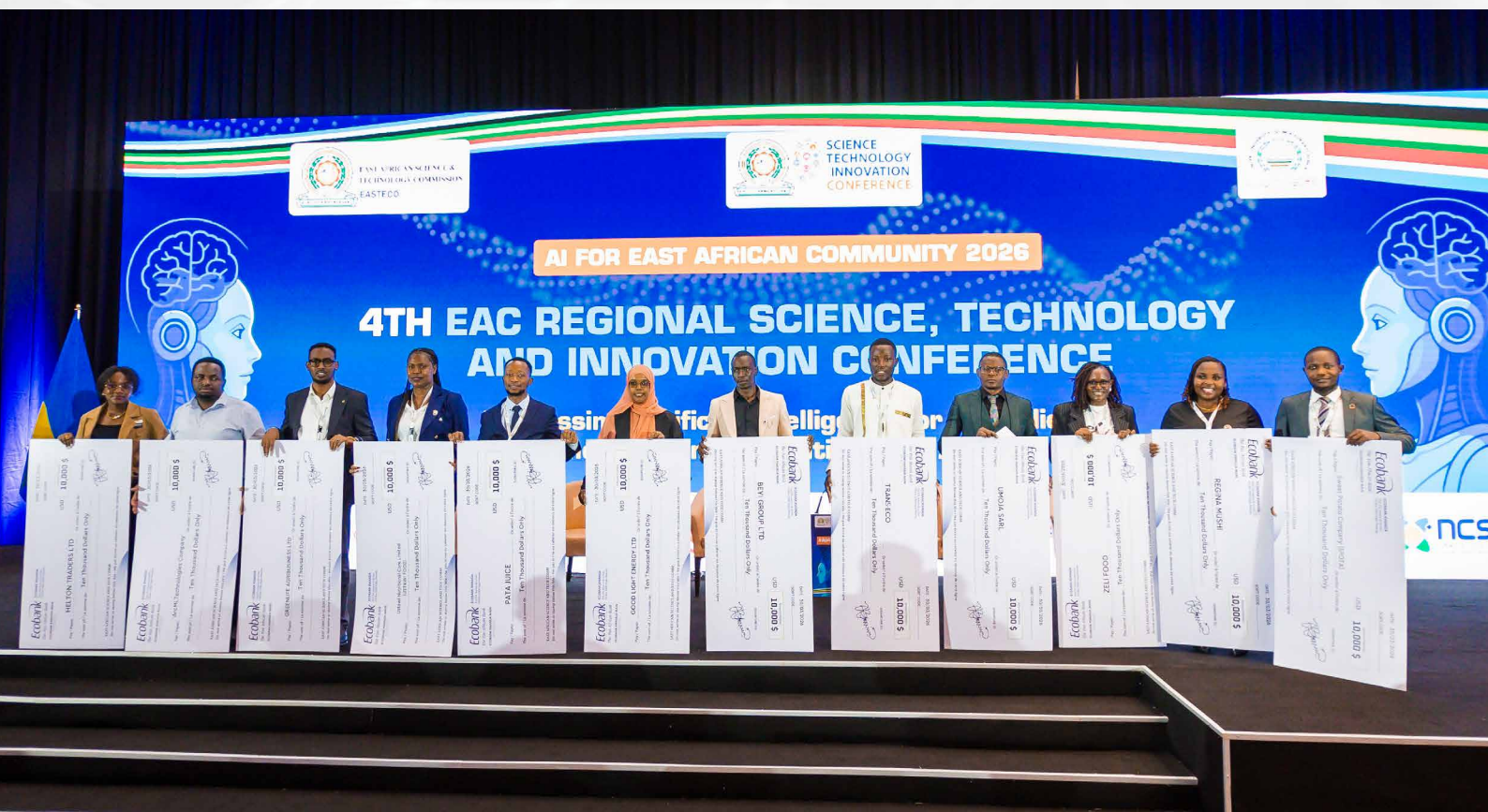
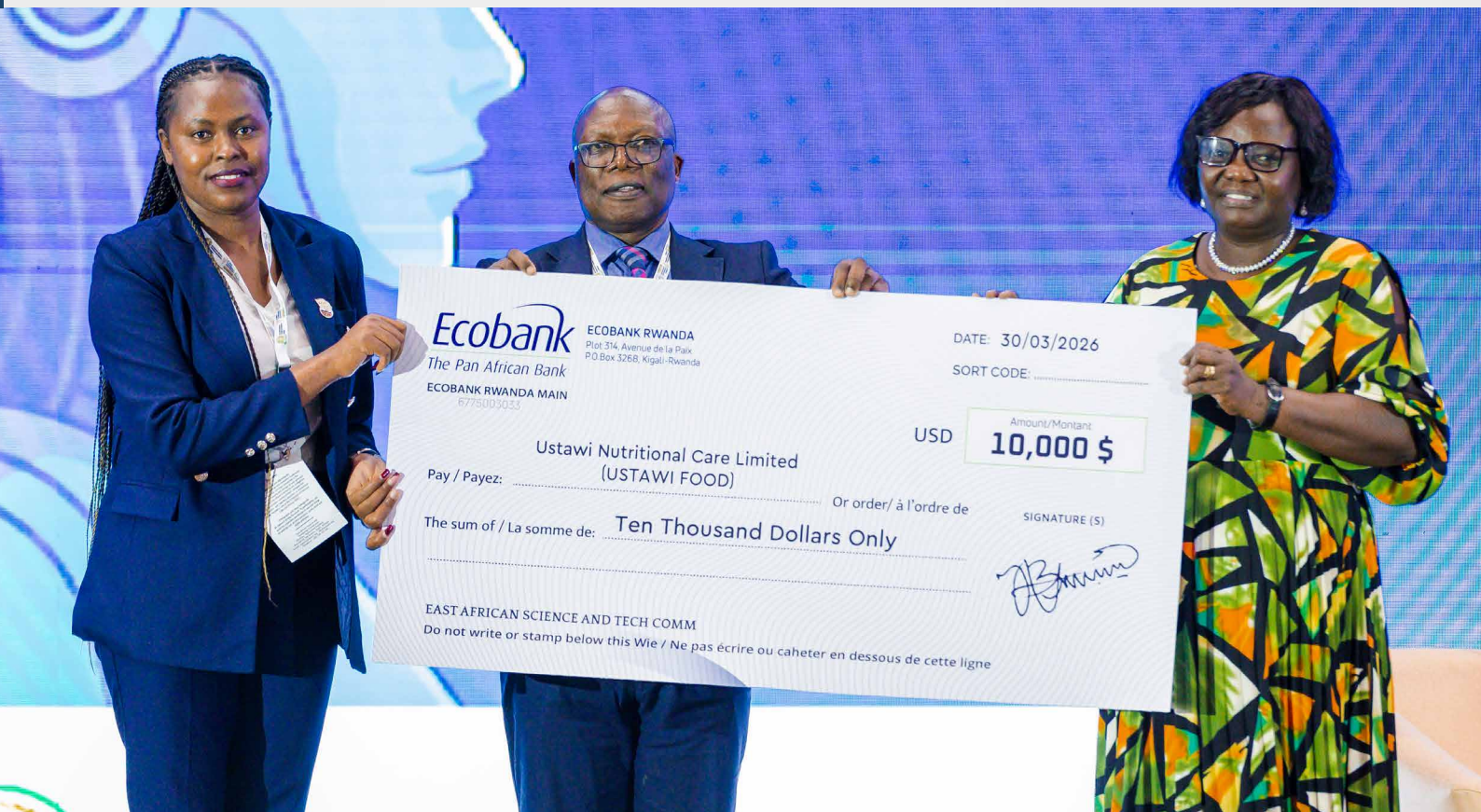
Selected enterprises were recognised through the awards and supported for further growth.

Awarded / Recognised Enterprises

The awards showcased a diverse portfolio of enterprises across key sectors:

1. Joseph Batunge – TRANS-ECO (Burundi)
2. Kevin Niyonkuru – Sweet Potato Company (SPOTA) (Burundi)
3. Victor Materanya Muzamba – Umoja SARL (DRC)
4. Philippe Koko Lipandasi – PATA JUICE (DRC)
5. Judy Mwendu Mutunga – Ustawi Nutritional Care Limited (Kenya)
6. Denis Taban Okeny – Kakuma Eco-Bag (Kenya)
7. Josiane Mujawayezu – Amazing Insect Ltd (Rwanda)
8. Enock Abayisenga – BEYI Group Ltd (Rwanda)
9. Mohamed Osman Abdulkadir – Greenlife Agribusiness Ltd (Somalia)
10. Ayan Ahmed Abdirahman – Goodlight Energy Ltd (Somalia)
11. Malish Simon Modi – TINV Trading and Investment Co. Ltd (South Sudan)

- 12. Mark Leon Peter – Plan B Recycle (South Sudan)
- 13. Regina Mushi – Plant Natural Feed Limited (Tanzania)
- 14. Luqman Yusuph Juma – ArchML Technologies Limited (Tanzania)
- 15. Ankunda Recho – Helton Traders Ltd (Uganda)
- 16. Esther Nafula Beatrice – Zeli Food (Uganda)



AI4EAC Innovation Challenge 2026

The AI4EAC Innovation Challenge 2026 was implemented as a regional initiative by the East African Community (EAC), in collaboration with IUCEA and EASTECO. The programme aimed to harness artificial intelligence to address real-world challenges across key sectors, while strengthening regional capacity in AI and data-driven innovation.

The awards component formed a central part of the programme, recognising high-performing participants and innovative solutions developed using real-world datasets. The Innovation challenge was supported by multiple partners including the German Cooperation, Japan International Cooperation Agency (JICA), UNESCO and Zindi.

The challenge attracted significant regional participation:

- 110 universities participated
- 3,852 registered participants
- 986 participants reached the final challenge weekend
- 5,126 total submissions were received

These figures reflected strong engagement across the region and highlighted the growing interest in AI-driven problem solving.

The awards programme aimed to:

- Recognise innovative, data-driven solutions addressing real-world challenges
- Promote the use of AI in key development sectors
- Provide visibility to emerging AI talent across East Africa
- Encourage collaboration between academia, industry, and policymakers

Participants developed solutions using real datasets, ensuring outputs were both technically robust and practically applicable.

Top Country Winners

Kenya: Sallyk12

Rwanda: Momo123

Burundi: vkdev

DRC: devsolver

Tanzania: Team agusule

Uganda: Team Zero Shot Tartans

Somalia: zakarie

Liquidity Stress Early Warning Challenge (Beginner)

1st: Momo123 (CMU Africa, Rwanda)

2nd: Sallyk12 (Riara University, Kenya)

3rd: devsolver (HEC Kinshasa, DRC)

Top Female: Afsa (ALU, Rwanda)

Climate & Health Risk Prediction Challenge (Beginner)

1st: Nyatuka (CMU Africa, Kenya)

2nd: Kulwa (University of Dodoma, Tanzania)

3rd: Re_gm (DeKUT, Kenya)

Top Female: Serah Njogu (Cooperative University, Kenya)

Skills2Job Intelligent Career Pathways Challenge (Intermediate)

1st: Lucia Yen (CMU, Rwanda)

2nd: Team Adventurers (Technical University of Mombasa, Kenya)

3rd: Eugene Mutembei (JKUAT, Kenya)

Top Female: Fatima Hassan (Jamhuriya University, Somalia)

Bean Flowering Detection Challenge (Advanced)

1st: Team Bean Team (Mount Kenya University, Kenya)

2nd: Team PK (CMU, Rwanda)

3rd: Team The Odyssey (CMU, Rwanda)

Top Female: AminKaka (University of Nairobi, Kenya)

The success of the 2026 edition laid the foundation for continued growth and regional engagement, with the next edition already anticipated:

AI4EAC Innovation Challenge 2027 - Coming Soon.

Collaborating Partners



University Partners



EAC Regional Space Science & Technology Strategy and EAC Regional Strategy for Innovation in the Informal Sector Launches

Two strategies were launched during this session:

1. The East African Regional Space Science and Technology Strategy, 2023-2028. The strategy aims to establish and integrate space strategy in East Africa.
2. EAC Strategy on Innovation In Informal Industrial Cluster.



Closing Remarks

Hon. Dr. Usta Kaitesi - Minister of State for Foreign Affairs, Rwanda

In the closing remarks, Rwanda's Minister of Foreign Affairs Dr. Usta Kaitesi commended the successful organisation of the conference and recognised the efforts of key regional institutions, including East African Science and Technology Commission and Inter-University Council for East Africa. She also congratulated the award winners and innovators, acknowledging their contributions to advancing science, technology, and innovation across the region.

The minister noted that progress in science, technology, and innovation within East Africa is encouraging, and highlighted the important coordination role played by EASTECO in driving regional collaboration. She emphasised that the strategies discussed during the conference reflect a bold and forward-looking agenda, with a strong focus on artificial intelligence, big data, and space science as key pillars of regional development.

A major highlight of the conference, she observed, was the adoption of the EAC Declaration on AI, which she described as a significant milestone for the growth and coordination of the AI ecosystem in East Africa. However, she cautioned that such declarations must go beyond symbolic value.

In her concluding message, the minister stressed the need for implementation, urging all stakeholders to move from commitments to concrete, decisive action. She underscored that the true measure of success will lie not in the declarations made, but in the tangible outcomes achieved in advancing innovation and development across the region.



EAC DECLARATION ON ARTIFICIAL INTELLIGENCE

We, the Ministers responsible for Science, Technology and Innovation, ICT, Education and East African Community Affairs, meeting in Kigali, Republic of Rwanda, on the occasion of the 4th EAC STI Conference 1st April, 2026.

Recognizing the strategic importance of Artificial Intelligence (AI) and emerging technologies as key drivers of economic transformation, regional integration, and sustainable development; Acknowledging the leadership of the EAC Secretariat and its organs and institutions in advancing the regional STI and digital transformation agenda;

Appreciating the support of partnerships, especially with the Government of Rwanda, Federal Republic of Germany, AUDA-NEPAD, AU Commission, UNESCO, NCST, and EAC Partners States for economic transformation in the EAC region;

Recalling the EAC Vision 2050, the EAC Digital Transformation Strategy, and the EAC AI Strategy as guiding frameworks;

HAVING DELIBERATED on a wide range of issues concerning the application of science, technology, and innovation, and in line with the conference theme, 'Harnessing Artificial Intelligence for a Resilient, Inclusive, and Innovative East Africa,' we aim to promote regional collaboration and strategic initiatives that advance AI for sustainable development in East Africa.

Hereby resolve to:

1. Support development of national innovative and responsible AI policies, frameworks and strategies aligned with the EAC regional Artificial Intelligence strategy.
2. Support the East African Community Artificial Intelligence Alliance to strengthen regional AI skilling, research and innovation to address regional challenges and drive technological advancement through a regional network.
3. Establish and strengthen the EAC Regional Centre of Excellence for Emerging Technologies to coordinate AI policy development, research, innovation, infrastructure, and skills development across the East African Community.
4. Establish a Regional AI Technologies Fund to scale AI research, innovation, and commercialization through flagship EAC regional programs, leveraging blended finance and private sector participation and develop bankable regional AI projects that drive economic transformation.
5. Strengthen regional AI human capital and skills development to build a future-ready workforce through harmonized curricula, certification, and accreditation frameworks.

6. Develop shared regional AI infrastructure through strategic investment in compute capacity, data centres, cloud systems, innovation hubs, and digital networks to reduce duplication and enhance scalability across Partner States.
7. Establish harmonized regional data governance frameworks and coordinate investments in shared digital infrastructure to foster a secure, inclusive, and resilient AI ecosystem that promotes regional integration.
8. Establish a Regional Multi-Stakeholder Digital Leaders Forum to harmonize national efforts with regional AI and digital priorities.
9. Promote African AI Sovereignty and Local Digital Ecosystems, to support development of local AI datasets, African language AI models, local cloud infrastructure, and technological architectures that ensure African ownership of data and AI systems.
10. Elevate Artificial Intelligence as a strategic industrial policy priority by integrating AI into national and regional development plans and strengthening evidence-based policy review and adaptive governance frameworks.
11. Promote Responsible, Ethical, and Inclusive AI Governance through risk-based regulatory frameworks, strengthened transparency and accountability, alignment with international standards, and the integration of ethical and inclusivity principles across all AI systems.
12. Strengthen Talent Retention and Support Homegrown Innovation; to create incentives, revise procurement systems, and develop innovation financing mechanisms that retain AI talent and scale locally developed solutions.
13. Reform AI Innovation and Research and Open Science Ecosystems; to promote open science, interdisciplinary research, indigenous knowledge integration, sustainable research financing, and improved research evaluation systems.
14. Strengthen Academia-Industry Collaboration and Applied AI Research through institutionalizing structured collaboration between academia and industry to align education systems with emerging industry needs.
15. Establish strategic global and regional partnerships and collaborative initiatives to advance the development and responsible deployment of Artificial Intelligence across East Africa region.



PROGRAMME



AI FOR EAST AFRICAN COMMUNITY 2026

4TH EAC REGIONAL SCIENCE, TECHNOLOGY AND INNOVATION CONFERENCE

Harnessing Artificial Intelligence for a Resilient, Inclusive
and Innovative East Africa

30 MARCH - 1 APRIL 2026

KIGALI CONVENTION CENTRE, RWANDA



The 4th EAC Regional Science, Technology and Innovation (STI) Conference is jointly organised by the East African Science and Technology Commission (EASTTECO) and the Inter-University Council for East Africa (IUCEA), in collaboration with a wide range of regional and global STI stakeholders. The Conference provides a strategic platform for harnessing Artificial Intelligence as a catalyst for a resilient, inclusive, and innovative East Africa. It seeks to foster coordinated regional action to address critical gaps in technical capacity, digital and AI infrastructure, investment in AI research and innovation, and the development of coherent governance and regulatory frameworks to support responsible and people-centred AI adoption across the region.

PROGRAMME

DAY 1: MONDAY 30TH MARCH 2026

08:00 - 09:00: Registration, Exhibition & Networking

09:00 - 11:00 CAT - Official Opening Session

Setting the stage for a Digitally Unified East African Community: AI as a Catalyst for the 7th EAC Development Strategy

Session Moderator: Dr. Fortunate Muyambi, Deputy Executive Secretary, EASTECO and Dr. Salome Guchu, Principal Innovation C Outreach officer, IUCEA.

Rapporteur: Dr. Louis Sibomana

Anthems: Rwanda National Anthem and EAC Anthem

Entertainment: Traditional Performance

Welcome Remarks:

- Prof. Idris Rai, Ag. Executive Secretary, IUCEA
- Dr. Sylvance Okoth, Executive Secretary, EASTECO
- Hon. Secretary General, East African Community
- Chair of The Council of Ministers EAC

Partner State Remarks:

Statements by Ministers responsible for ICT/STI: Republic of Burundi, Republic of Rwanda, Republic of Uganda, United Republic of Tanzania, Republic of South Sudan, Democratic Republic of DRC and Federal Republic of Somalia

Partner Remarks:

- Dr. Tom Kariuki, Founding CEO, Science for Africa Foundation
- Louise Haxthausen, Director, UNESCO, Regional Office for Eastern Africa
- Norman Schraepel, GIZ Cluster-Coordinator Rwanda
- Barbara Barone, European Union Dar Es Salaam, Tanzania
- Hon. Prof. Gaspard Banyankimbona - Commissioner AU- ESTI
- H.E. Nardos Bekele-Thomas, CEO, AUDA-NEPAD

Official Opening Address: Guest of Honour: Hon. Paula Ingabire, Minister of ICT and Innovation, Rwanda

Photo Session

11:00 - 11:30 CAT- Health Break / Exhibition Tour

11:30 - 12:30 CAT - Plenary Session 1

Theme: The Strategic Role of AI in East Africa's Development, Regional Transformation and Integration

Session Moderator: Jade Makory, Regional Digital Transformation and AI Advisor;

Rapporteur: Dr. Marie Chantal Cyulinyana.

Keynote Presentation:

"AI as a Cross-Cutting Driver of Resilient and Inclusive Growth in East Africa"

by Olivier Twagirayezu – Centre of Fourth Industrial Revolution-Rwanda

by Nakul Jain- CEO C Managing Director, Wadhvani AI Global

Panelists:

- Maria Namyalo, APET, AUDA-NEPAD
- Celina Lee, CEO, Zindi
- Suraj Juddoo, Senior Lecturer and AI Consultant, UNDP C Middlesex University

Discussion / QGA

12:30 - 13:30 CAT - Plenary Session 2

Theme: AI Infrastructure, Research C Innovation Ecosystems in East Africa

Session Moderator: Sonia Bagumako, Regional AI Advisor;

Rapporteur: Prof. Charles Karuku Gachuri

Keynote Presentation:

"Building Regional AI Infrastructure and Research Capacity in Africa"

by Amine Idriss, Director of Economy Infrastructure and Trade, AUDA-NEPAD

Panelists:

- Nicholas Mponimba, CEO, RENU Uganda
- Prof. Madara Ogot, CEO, UbuntuNet Alliance
- Cedric Meshie, Co-Founder, Neotex.ai
- Claude Migisha, Technology and Data Expert, Rwanda

13:30 - 14:30 CAT- Lunch Break, Exhibition and Poster Session

14:30 - 15:30 CAT- Plenary Session 3

Theme: Building a Skilled AI Workforce for the East African Community

Session Moderator: Brenda Nakazibwe, Team Leader Pathogen Economy, STI Secretariat-Office of the President;

Rapporteur: Dr. Japhet Niyobuhungiro.

Keynote Presentations:

"Empowering the Human Age: Building a Future Ready Workforce in Age of AI "

by Ben Ruhinda, Senior Systems Officer, IUCEA

"University-led AI incubators for inclusive regional development"

by Jaume Fortuny, Senior Project Manager, OBREAL

Panelists:

- Dorothee Weyler, Director, Regional Office for Africa, DAAD
- Charles Wanyonyi, UNESCO, Education, Campus Africa
- Dr. Neema Mduma, Computer Scientist and Senior Lecturer, NM-AIST
- Dr. Houssein Ahmed Assowe, Director of the Mathematics and Numerical Research Centre, University of Djibouti

Discussion/ QGA

15:30 - 17:00 CAT - Plenary Session 4

Theme: Ethics and Responsible AI in the East African Community

Session Moderator: Hugue Ngandeu Ngatta, Head of Unit for Social and Human Science, UNESCO;

Rapporteur: Dr. Didacienne Mukanyiligira

Keynote Presentation:

"Human-Centred and Ethical AI for East Africa"

by Bill Faruki, Founder C CEO, MindHyve.ai

Panelists:

- Prof. Damien Hanyurwimfura, Lead, Centre of Excellence for Internet of Things, University of Rwanda
- Paola Gálvez-Callirgos, AI Ethics C Technology Policy Expert, MPP University of Oxford
- Dr. Joyce Nakatumba-Nabende, Head of AI Lab, Makerere University
- Malcolm Kijirah (CELA), Government Affairs Manager, Kenya, Microsoft
- Teddy Nalubega, Founding Managing Director, Ubuntu Center for AI Governance and Innovation
- Karim Attoumani Mohamed, Expert, Digital Governance, Telecommunications Regulation C the Ethics of AI, Comoros

Discussion/ QGA

17:00 - 18:00 END OF DAY ONE

DAY 2: TUESDAY 31ST MARCH 2026

09:00 - 10:00 CAT- Plenary Session 5

Theme: The Role of Open Science and Diplomacy in Global and Regional AI Advancement

Session Moderator: Nicole Mulaku, Programme Officer, TCC Africa;

Rapporteur: Ms. Diana Umulisa

Keynote Presentation:

“Advancing Responsible AI Through Open Science and Science Diplomacy: Connecting Partner States for Inclusive Regional Innovation”

by Dr. Joy Owango, Executive Director, Training Centre in Communication (TCC Africa)

Panelists:

- Dr. Henry Waruhiu, Director Research and Management, ESAMI
- Dr. David Ngigi, Acting Director General, NACOSTI
- Christian Kohl, Director of Technology and Engineering, Public Library of Science, PLOS
- Nicole Mulaku, Programmes Officer Library and Consortia, TCC

Discussion / QGA

10:00 - 13:00 CAT Plenary Session 6: Side Events

AUDA-NEPAD and Science for Africa Foundation	EAC AI Alliance	Africa Research and Impact Network (ARIN)	East African Journal of Science, Technology and Innovation
<p><u>Advancing the AU Vision for Open Research in Africa</u></p> <p>Session 1: Led Framing of Open Research-Led Framing of Open Research</p> <p>Session 2: Presentation: SFA Foundation Contribution Toward an Africa-Led Vision for Open Research</p> <p>Session 3: Presentation: SFA Foundation Science Computing and Data for Health.</p> <p>Session 4: Moderated High-Level Panel Discussion</p> <p>Session 5: Interactive Group Consultations</p> <p>Session G: Synthesis C</p>	<p><u>The First East African Digital Leaders Forum on Artificial Intelligence</u></p> <p>Session 1: Introduction and Opening Remarks</p> <p>Session II: Introduction to the EAC Digital Transformation Strategy Governance Structure, Overview of the Digital Leaders Forum (DLF) structure and composition; and the EAC AI Alliance</p> <p>Session III: Presentation of the Draft EAC Regional AI Strategy QCA and stakeholder reflections</p> <p>Session IV: Regional Collaboration for Shared AI Infrastructure in East Africa Keynote presentation and</p>	<p><u>Leveraging Responsible AI for Climate Resilience in Africa: Policy Readiness, Capacity Building, and Action Pathways</u></p> <p>Session 1: Opening and Context Setting Overview of the Leveraging AI for Climate Resilience Solutions in Africa project Positioning the side event within the EAC STI Conference thematic agenda</p> <p>Session 2: Policy and Regulatory Readiness for AI and Climate Resilience Status of AI policies and regulatory frameworks for climate resilience in East Africa</p> <p>Session 3: Capacity Building for Responsible AI –</p>	<p><u>EJSTI Editorial Board to enhance, advance and disseminate scientific, technological and innovative knowledge that supports East African regional development</u></p> <p>Opening Remarks</p> <p>Session 1: EJSTI Progress Update: Presentation on the progress and achievements of the Journal since the last Annual General Meeting.</p> <p>Session 2: Policy Discussion and Strategic Direction: Consideration of key policy issues and strategic priorities for the Journal.</p> <p>Session 3: Editorial Board Work plan and Budget: Presentation and discussion</p>

Identification of AU Led Next Steps Closing Remarks	discussion on regional AI infrastructure, data ecosystems, and research collaboration Session V: Moderated Discussion: Opportunities for Regional AI Collaboration Session VI: Discussion on concrete opportunities for regional collaboration on AI across the East African Community. Closing Remarks	Insights from Practice Presentation: Capacity needs of ECRs and policymakers in AI for climate resilience Session 4: Applied AI for Anticipatory Action and Humanitarian Resilience Session 5: Way Forward and Action Pathways Identification of priority actions for policy, capacity building, and collaboration, and Opportunities for regional partnerships and follow-up engagement	of the Editorial Board work plan and budget for the upcoming financial periods. Session 4: Inauguration of New Editorial Board Members C OJS Orientation: Introduction of new members and briefing on the operation of the Open Journal Systems (OJS). Any Other Business Way Forward and Closing Remarks
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13:00 - 14:00 CAT- Lunch Break, Exhibition and Poster Session

Working Health Break

14:00 - 17:00 CAT- Parallel Sessions 7: Paper Presentations

14:00-15:00 CAT	Parallel Session 1A: AI for Agriculture & Food Security Moderator: Prof. Eson Daniel Karimuribo Rapporteur: Prof. Charles Karuku Gachuri	AD 4 - Parallel Session 1B: AI for Health, wellbeing & Biomedical Innovation Moderator: Dr. Benson R. Kidenya Rapporteur: Prof Callixte Yadufashije	AD 12 - Parallel Session 1C: AI for Education, Skills development & Research Excellence Moderator: Mr Charles Wanyonyi Rapporteur: Everlyne Akoth Otero
(Each Presenter 10 Minutes then QCA: 20 Minutes at the end of presentations)	Geoffrey Dan Odokonyero: Optimizing Seed Crop Selection for Variable Climates: An AI-Based Approach to Enhancing Agricultural Productivity using Vertical Farming Emmanuel Ndayisenga: An AI-Driven Solar Energy Monitoring System for Energy-Efficient Operation of Milk Storage Chillers Dr Paul O. Mireji: Computational annotations of antennal genes in tsetse flies Gladness Mwanga: Precision Livestock Farming (PLF) Technologies Evaluation for Smallholder Farming in Africa: A Case Study of Tanzania	Boniface Ntambara: Stroke Risk Prediction using Machine Learning Asifiwe Makawa: AI-driven Prediction Model for Cardiovascular Diseases Nabugewa Fiona: Development of a Machine Learning model for predicting and classifying risk factors associated with neonatal deaths at Rakai General Hospital Amos Okot: Predicting Mosquito Age and Species Using Mid-Infrared Spectroscopy and Artificial Intelligence for Rapid, Reagent-Free Malaria Surveillance Wilson OKAKA: Effectiveness of	Wilberforce Mfitundinda: Administrative Intelligence: Quantifying Drivers of AI Adoption for Efficiency in Ugandan Universities Anthony Marugu: Semantic-Driven Sign Motion Generation via Hierarchical Discrete Tokenization and Masked Transformers Simon Ngalomba : Transforming Research Governance through Artificial Intelligence: Opportunities and Challenges in Tanzanian Universities Dr Gastervas Geoffrey Rutwara Mugume: Leveraging Open Education Data and Artificial Intelligence for Data-Driven

	<p>Charlyne Jepkosge: A GEOAI-based smart seed zone recommender system for climate-resilient agriculture in East Africa</p>	<p>Science Journalism in Understanding Biomedical Health Innovation through AI-Propelled Digital Herbal Clinical Trials for Community Health in Uganda</p> <p>Gideon Luper Abako: Predictive Health Supply Chains in Low-connectivity Settings: An Offline-first AI Framework for Uganda</p>	<p>Institutional Governance in Uganda's Tertiary Education Sector</p> <p>Dr Florence Kamonjo: Artificial intelligence in academic practice: Patterns of use and student perceptions in Kenyan universities</p>
15:00-16:00 CAT	<p>Parallel Session 2D: AI for Climate Resilience, Environment & Natural Resources Moderator: Prof. Nzioka John Muthama Rapporteur: Dr. Pancras Ndokoye</p>	<p>AD 4 - Parallel Session 2E: AI for Industry, Service Delivery & Digital Economy Moderator: Prof. Joel S. Mtebe Rapporteur: Prof. Jude Lubega</p>	<p>AD 12 - Parallel Session 2F: AI for Education, Skills development & Research Excellence Moderator: Dr. Joshua K. Kibet Rapporteur: Prof. Thomas Olwal</p>
	<p>Jean Claude Hakizimana: Using Machine Learning and Satellite Data for Improving Flood Prediction in the Rusizi Basin</p> <p>Prof. Caroline Mulinya: Transforming Smallholder Resilience: An AI-Driven Framework for Climate-Smart Agriculture in Kakamega County, Kenya</p> <p>Richard Cartland: Analysis of AI driven flood forecast system in Uganda</p> <p>Mati Rita: Data-driven climate action: A geospatial AI tool for optimizing regional climate investments</p> <p>Senior Diop Ndeko Mubembe: Medicinal and nutritional floristic Potential of relict forests in Kaziba traditional landscape Eastern DR Congo: Identification Using Digital Network Platform and Database</p>	<p>Richard Kimera: Design and Validation of Trust-Weighted Machine Learning Models for Predicting Multi-Factor Authentication Adoption Using the Unified Theory of Acceptance and Use of Technology (UTAUT) Framework</p> <p>Dr Julius Niyongabo: Bearing fault detection and diagnosis based on an optimized densely connected convolutional network and an improved residual network</p> <p>Damaris Apondi Were: Implementation of QR Code Payments to Streamline Patient Billing at Avenue Hospital Kisumu</p> <p>Benon Omwenga Nyabuto: Development of a predictive model for determining temperature distribution in concrete slab using embedded sensors</p> <p>Richard Cartland: Intelligent Solar Monitoring System</p>	<p>Dr Fredrick Edward Kitoogo: A Low-Cost AI Onboarding Agent Suite for Tertiary Education Institutions in Africa</p> <p>Ndolo Daniel Mulinge: Bridging the Digital Divide: Evaluating ICT e-Readiness in Kenyan Higher Education Institutions</p> <p>Japheth Mandela ISABOKE: Democratizing Animation: AI-Driven Pipeline Optimization in Emerging Creative Markets</p> <p>Dr. Businge Phelix Mbabazi: Ethical AI Governance in Resource-Constrained Higher Education. A case of Kabale University framework</p> <p>Lawino Giovanna: Teacher Support and professional development Needs that influence Adoption of Artificial Intelligence in the Teaching process at public universities. A case of Teaching staff at Makerere University Business school Uganda</p>

		Richard Musanje: MAVIC: Multi-Agent Pipeline for Critical Infrastructure Monitoring Through Crowd- Sourced Multimodal Data	Lucian Ngeze: Artificial Intelligence as a Catalyst for Pedagogical Transformation in Higher Education: Case of Academic Staff of the Inter-University Council of East African Member Institutions
16:00-17:00 CAT	Parallel Session 3G: AI for Agriculture & Food Security Moderator: Dr. Margaret Nyawira Lukuyu Rapporteur: Prof. Jaffu Othniel Cholongola	AD 4 - Parallel Session 3H: Innovation & Commercialization of AI Solutions in Agriculture Moderator: Prof. Abdi T. Abdalla Rapporteur: Everlyne Akoth Odero	AD 12 - Parallel Session 3I: AI for Health, Wellbeing & Biomedical Innovation Moderator: Dr Kijakazi Obed Mashoto Rapporteur: Prof. François Niyonzima Niyongabo
	<p>Alice Ndikumwenayo: AI-Powered Smart Nursery for Elite Coffee Seedling Production: A Hybrid Edge-Cloud Architecture for Agricultural Transformation in Burundi</p> <p>Nakaima Amina: Market Price Prediction Model for Agricultural Products Using Time Series Analysis: A Context of Coffee in Low Resource Environments</p> <p>Rehema Salum Abdallah: Machine Learning Approach for Predicting Rice Production in Tanzania by Integrating Economic and Environmental Factors</p> <p>Dr Casiana Blasius Lwiwa: AI-Enhanced Climate Monitoring to Optimize Insulated Solar Box Cooker Using Thermal Energy Storage Materials</p> <p>Samuel Kamau: Improving City Resilience with AI-Assisted Adaptive Zoning</p>	<p>Harriet Ratemo: Ground Truth to Digital Intelligence: ML-Powered Soil Monitoring for Food-Secure East Africa</p> <p>Tinah Manduna Mutabazi: AI-Driven UAV and Deep Learning for Climate-Resilient Coffee Farming in Uganda</p> <p>Brown Gwambene: Leveraging AI to Enhance Market Access and Real-Time Farmer Advisory Services for Agricultural Productivity and Food Security in the East African Community</p> <p>Dr Rapheal Wangalwa: AI reveals how climate change is shrinking optimal land for staple crops and escalating food security risks in Uganda</p>	<p>Solomon Piwun BME: CaviScope: AI-Community-Centric Innovation for Expanding Access to Early Cervical Cancer Screening in Uganda</p> <p>Samuel James Kibanga: Uganda Cancer Care Super App (UCCA): An AI Enabled Digital Cancer Care Ecosystem for improved treatment Access and Continuity</p> <p>Solimo Rajab: A human-in-the-loop explainable ensemble machine learning framework for adaptive and trust-aware severe malaria prediction</p> <p>Japhari Muna Mbaru: Few-Shot Sign Language Recognition Using CLIP's Contrastive Multimodal Framework for Healthcare</p> <p>Aymar AKILIMALI: Leveraging Machine Learning for Enhanced Spatiotemporal Forecasting of Malaria Mortality in Children Under Five in the Democratic Republic of Congo</p>

17:30 CAT - SNACK & END OF DAY TWO

DAY 3: WEDNESDAY 1ST APRIL 2026

09:00 - 11:00 CAT - Plenary Session 8

Women and Youth Innovation & Entrepreneurship

Keynote Presentation:

**"Supporting Youth and Women AI Innovators and Entrepreneurs
(Finance, Incubation & Policy)"**

by Johnny Falla, Associate Director, Innovation & Technology Pillar at Equity Group Foundation

Moderator: Dr. Fortunate Muyambi; **Rapporteur:** Mr. Jean Louis Niragire

**Women and Youth-led Innovations and Entrepreneurship
Pitches & Demonstrations
16 Entrepreneurs across 8 Partner States**

10:00 - 11:00 CAT - Parallel Session A	10:00 - 11:00 CAT - Parallel Session B
UNESCO Capacity building for policy makers	Strengthening Africa's Voice in Global AI Governance - African Advanced Level Telecommunications Institute (AFRALTI) and British High Commission

11:00 - 11:30 CAT - Coffee / Tea Break

11:30 - 12:30 CAT - Plenary Session 9

Theme: Powering AI with East African Data, Local Content and Languages

Moderator: Robin Miller, Axum; **Rapporteur:** Mr. Benjamin Nabaana

Keynote Presentation:

**"Unlocking Growth Through Data and Language Technologies:
Building AI Systems that reflect East Africa"**

by Audace Niyonkuru, Digital Umuganda

Panelists:

- Dr. Caroline Asiimwe, Executive Secretary, East Africa Kiswahili Commission
- Hezekiel Gikambi Peter, Language Technologist, AI and Media Linguist, Kenyatta University
- Dennis Kevogo, Group Chief Data Strategist, Jubilee Holdings Limited
- Ngugi Peter Karema, CEO, PromptBI
- Patrick Albert Ipola, Program Officer, Pathogen Economy, STI-Secretariate -Office of the President Uganda

Discussion / Q&A

Theme: Young Innovators at the Forefront of Africa's AI Transformation

Moderator: Brenda Nakazibwe, Pathogen Economy Team Leader, Uganda

Rapporteur: Dr. Pancras Ndokoye

Keynote Presentation:

"From Talent to Transformation: Empowering Young Innovators to Lead Africa's AI Future"

by: Barbara Glover, Programme Officer, AUDA-NEPAD

Panelists

- Ganza Rosine Ingabire
- Paul Masamvu
- Olav Biraboneye
- Yves Izere
- Bruno Manzi

13:30 - 14:30 CAT- Lunch Break, Exhibition and Poster Session

14:30 - 17:00 CAT- Plenary Session 11: Ministerial Session (Panel Discussion)

Ministerial Dialogue: Strengthen Leadership and Policy Coordination for Responsible AI Adoption and Regional Competitiveness in the EAC

Session Moderator: Hon. Andrea Ariik Malueth, DSG EAC.

Rapporteur: Dr. Offoro N. Kimambo

Keynote Presentation:

"Strengthen Leadership and Policy Coordination for Responsible AI Adoption and Regional Competitiveness in the EAC"

by Dr. Monica Musenero Masanza, Minister of Science, Technology, and Innovation under the Office of the President - Uganda

Feedback / Responses from Partner States Ministers how to strengthen Leadership and Policy Coordination for Responsible AI Adoption and Regional Competitiveness in the EAC.

- Minister - Democratic Republic of DRC
- Minister - Federal Republic of Somalia
- Minister - Republic of Burundi,
- Minister- Republic of Kenya
- Minister - Republic of Rwanda,
- Minister - Republic of South Sudan,
- Minister - Republic of Uganda,
- Minister - United Republic of Tanzania,

Presentation of Ministerial Resolutions Implementation from the 3rd Science, Technology and Innovation Conference-2024

- Dr. Sylvance Okoth - Executive Secretary, EASTECO

Presentation of Consolidated Thematic recommendations from the Plenary Sessions by Rapporteur General-Conference Communiqué

Awards Ceremony for Innovation and Entrepreneurship Challenges

Announcement of AI4EAC Challenge Winners

**Launch: EAC Regional Space Science and Technology Strategy and
EAC Regional Strategy for Innovation in the Informal Sector
- Industrial Clusters**

Ministerial Dialogue & Endorsement of Resolutions

Adoption of Kigali Declaration on AI for East Africa

17:00 - 17:30 CAT- Closing Remarks

- Prof. Idris Rai, Ag. Executive Secretary, IUCEA
- Dr. Sylvance Okoth, Executive Secretary, EASTECO
- Secretary General, EAC
- Hon. Minister of State for Foreign Affairs: Dr. Usta Kaitesi, Republic of Rwanda

17:30 CAT- END OF THE CONFERENCE



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