



**DEPARTMENT OF  
COMPUTER SCIENCE**  
AHMADU BELLO UNIVERSITY, ZARIA

# Proceedings *of the* 3<sup>rd</sup> International *Conference*

**ON COMPUTING & ADVANCES IN INFORMATION TECHNOLOGY**

## ICCAIT 2025

**THEME:** Leveraging AI to Drive Sustainable  
Growth in Emerging Economies

18<sup>TH</sup> - 20<sup>TH</sup> NOVEMBER, 2025

**EDITORS**

A. Abdulrahim  
M. A. Umar  
Y. A. Sahabi

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# Proceedings of the

International Conference on Computing and Advances in  
Information Technology (ICCAIT 2025)

**November 18 – 20, 2025**

**Yusuf Bala Usman Hall, Ahmadu Bello University, Zaria, Nigeria**

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## Editors

A. Abdulrahim  
M. A. Umar  
Y. A. Sahabi

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## FORWARD

It is with great pleasure that I welcome you to the **3rd International Conference on Computing and Advances in Information Technology (ICCAIT) 2025**. This edition of the conference continues to highlight the transformative role of computing and information technology, with a particular focus on the theme: *“Leveraging AI to Drive Sustainable Growth in Emerging Economies.”*

In today’s rapidly evolving digital landscape, Artificial Intelligence (AI) has emerged as a critical enabler of innovation and sustainable development. For emerging economies, AI presents significant opportunities to address pressing challenges, including economic diversification, resource optimisation, improved service delivery, and inclusive growth. This conference provides a vital platform for researchers, practitioners, and policymakers to explore how AI-driven solutions can be effectively harnessed to accelerate sustainable development across key sectors such as healthcare, education, agriculture, finance, and governance.

The proceedings of ICCAIT 2025 present a rich collection of peer-reviewed papers that reflect cutting-edge research, practical innovations, and interdisciplinary approaches in computing and information technology. The contributions in this volume demonstrate not only the growing maturity of AI applications but also their potential to create lasting impact in emerging economies. They underscore the importance of collaboration, knowledge exchange, and context-aware solutions in addressing global and local challenges.

We extend our sincere appreciation to all authors, reviewers, and members of the technical programme committee for their invaluable contributions and commitment to maintaining the high standards of this conference. We also acknowledge the efforts of the organising committee and all participants whose engagement has made ICCAIT 2025 a success.

We trust that the insights presented in this volume will inspire further research, innovation, and collaboration, and we look forward to welcoming you to future editions of ICCAIT.

**Prof. Mohammed Abdullahi**

Chairman, Local Organizing Committee

## PROFILE OF INVITED SPEAKERS

### **Kashifu Inuwa Abdullahi, CCIE**

*Director General/CEO, National Information Technology Development Agency*

Kashifu Inuwa Abdullahi, Director-General/CEO of the National Information Technology Development Agency, NITDA, is a transformational expert with key competencies across policy formulation, administration, growth management, talent development, solutions architecture, resource mobilisation and strategy implementation. Inuwa is a thoroughbred IT professional, with an impressive resume in public and private sector IT development, policy formulation, and IT governance. He graduated with a bachelor's degree in computer science from Abubakar Tafawa Balewa University Bauchi. He holds various executive certificates from top-notch universities such as Harvard University, University of Cambridge, London Business School and Oxford University, UK. Abdullahi is also an alumnus of the prestigious IMD Business School, Switzerland, and a trained strategist from the world-famous Massachusetts Institute of Technology (MIT). He equally holds many professional certifications in telecommunications, service management, networking, and solution design. Inuwa being the first Cisco Certified Internetwork Expert (CCIE) in Nigeria's public sector has bagged nearly 2 decades of experience in the public and private IT space. He started his professional career at Galaxy Backbone Ltd where he served as a network engineer and senior network and lead solution architect. In 2014, he joined the Central Bank of Nigeria (CBN) as a Technology Architect where he was part of the team that developed the CBN Technology Architecture Repository (TAR) and also executed software license rationalization that has increased cost savings for the bank in licensing annual subscription. He joined NITDA in 2017 as the Technical Assistant to the then Director General, Professor Isa Ali Ibrahim Pantami, and has significantly contributed to the Agency's growth and development. On 20th August 2019, Mr. Inuwa was appointed the Director-General of NITDA by the President of the Federal Republic of Nigeria, Muhammadu Buhari, GCFR. Thus far, Mr. Inuwa has steered the Agency along the path of working creatively and assiduously for the growth of the IT sector in Nigeria. Under the direction of Mr. Inuwa, NITDA has achieved several milestones in just three years. He has rolled out various programmes towards digital transformation, talent development, digital innovation and entrepreneurship, developmental regulations, exploring emerging technology, and promotion of indigenous IT content amongst others.

## PROFILE OF KEYNOTE SPEAKERS

### **Professor Tutut Herawan**

*University of Malaya, Malaysia*

Tutut Herawan is an associate professor at the Department of Information Systems, Faculty of Computer Science and Information Technology, Universiti Malaya, Malaysia. He was named in the Top 2% World Scientists Ranking by Stanford University and Elsevier BV, since 2020-present. He received a PhD degree in information technology from Universiti Tun Hussein Onn Malaysia in 2010. He has more than 20 years experiences as academic staff and has supervised many Master & PhD students. He is the editor advisory board of ISEM Springer Nature and Managing Editor of Malaysian Journal of Computer Science (ISI WoS and Scopus index). He is also an associate editor of many international journals of Scopus and Web of Science indexes. He has edited many books and published more than 350 articles in various book chapters, international journals, and conference proceedings. He is an active reviewer for many reputable international journals. He delivered more than 50 keynote addresses, invited workshop and seminars, and has been actively served as a chair, co-chair, program committee member and co-organizer for numerous international conferences/workshops. His research area includes data science and big data, data engineering and information systems, soft computing and data mining, and information technology for tourism.

**Dr. Sadiq Sani**

*University of Greenwich, United Kingdom*

Dr Sadiq Sani is an Associate Professor in Cybersecurity. He holds a bachelor's degree in computer science from Ahmadu Bello University, Zaria, Nigeria. He received a PhD degree from The University of Sydney and professional education from the Massachusetts Institute of Technology. He is a Certified Ethical Hacker and an EC-Council Certified Security Analyst. With several professional and industry certifications and training in cybersecurity and Information Technology (IT), he is a highly trained cybersecurity, Information and Communications Technology (ICT), and Energy IT expert; with several years of industry experience and expertise ranging from penetration testing and countermeasures, through security architecture and engineering, to Industrial Control System (ICS) cybersecurity and network security. He is versed in the Internet of Things (IoT), and distributed ledger technologies (such as blockchain). Dr Sani works closely with the industry, currently advising on cybersecurity, ICT, OT, and Artificial Intelligence (AI). He is the OT Lead for the Cyber-Physical Systems Group at the Centre for Sustainable Cyber Security (CS2) at the University of Greenwich. CS2 is a UK National Cyber Security Centre (NCSC) Academic Centre of Excellence in Cyber Security Research. Dr Sani also leads multiple innovation and consultancy projects at CS2. Prior to joining the University of Greenwich, Dr Sani was an industry-oriented researcher/project lead and a lecturer at the University of New South Wales and The University of Sydney, respectively. He focuses on industry research; his primary research interests include OT cybersecurity, applied cryptography, sustainable cybersecurity, IoT security and privacy, energy internet and smart grid/microgrid cybersecurity, energy security, distributed key management, risk assessments, IoT distributed ledger and cryptocurrency technologies, quantum cryptography, network and communication security, secure software engineering, and distributed federated learning. Dr Sani is a member of EC-Council, ICS-CERT, ACS, IEEE, and ACM. He is a technical paper reviewer for IEEE TDSC, IEEE TIFS, IEEE TII, IEEE ICDCS, IEEE TrustCom, IT Professional, IEEE TEM, IEEE IoT-J, and ACM Computing Surveys. He holds key intellectual property in identity management, cryptocurrency, and distributed ledger technologies.

**Professor Aisha Abdulkadir**

*Institute for Agricultural Research (LAR), Ahmadu Bello University, Zaria, Nigeria*

Prof. Aisha Abdulkadir obtained both her B.Agric and MSc. Soil Science Degrees from Department of Soil Science, Ahmadu Bello University, Zaria, Nigeria in years 2000 and 2006, respectively. She obtained her PhD from Wageningen University, The Netherlands, where she worked with Late Prof. Herman van Keulen (Soil Physicist) and on Modelling nutrient flows and balances in agroecosystems with MONQI model in Plant Production Systems Group. She is currently employed by Ahmadu Bello University (ABU), Zaria, in the Department of Soil Science since the year 2002 with specialization in Soil Physics, and where she is involved in teaching and supervision of both undergraduate and postgraduate students. She worked with several committees in the University community and beyond. She received an individual research grant from International Foundation for Science (IFS) in 2013, and African Fulbright Research Fellowship as a Senior Visiting Scientist at the University of Nebraska, Lincoln, USA, in 2017, where she worked on greenhouse gas emissions from soils under different water and nutrient management at the Agronomy and Horticulture Department. She has been involved in farming systems research with focus in North-Western States of Nigeria and as a research team member in a World Bank Sponsored SRI-TRIMING On systems of rice intensification (SRI). She has worked on several extension-based projects in partnership with NAERLS and several other international organizations such as ECOWAS, IFPRI, AGRA-CBA Project, World Bank, Wageningen University and Research, Global SRI-Network, SRI-2030, SouthSouthNorth, Global Methane Hub among others. She is a farming systems expert on research and extension on sustainable crop production, use of crop and water models in hydrological research, soil and water conservation practices as well as climate-smart agricultural practices geared towards all its pillars to reduce greenhouse gas emissions (sustainable production, adaptation and mitigation strategies). She has also served as a resource person in notable projects on extension and sustainable farming systems.

**Prof. Ezugwu E. Absalom**  
*North-West University, South Africa*

Absalom El-Shamir Ezugwu is a computer scientist specialising in applied artificial intelligence and computational intelligence, with a strong focus on industry-driven and impactful research. He is a full Professor in the Data Science and Computing unit at North-West University, Potchefstroom, South Africa, where he leads the Computational Intelligence Research Group. He also holds a visiting research professorship at the University of the Witwatersrand, Johannesburg, South Africa. Absalom earned his PhD and MSc in Computer Science, as well as a BSc in Mathematics with Computer Science, from Ahmadu Bello University, Zaria. His research interests span optimization, machine learning, swarm intelligence, and nature- and biologically inspired algorithms, with emphasis on the theory, design, and application of computational models motivated by natural and linguistic systems. He has published more than 150 peer-reviewed articles in reputable international journals and conferences such as Knowledge-Based Systems, Expert Systems with Applications, Future Generation Computer Systems, and Information Sciences. Absalom actively collaborates with leading researchers globally and mentors a diverse cohort of postgraduate students, including master's, doctoral, and postdoctoral fellows, to develop innovative solutions to real-world challenges. His work reflects a deep commitment to advancing computational intelligence and fostering the next generation of AI researchers.

## CONFERENCE PROGRAMME

**Tuesday, November 18, 2025**

**Day 1: Plenary Session**

Time	Activity	Venue
08:00 – 09:00	Registration	Yusuf Bala Usman Hall, Ahmadu Bello University, Zaria
10:00 – 10:05	Introduction by Master of Ceremony (MC)	
10:10 – 10:15	National Anthem	
10:10 – 10:15	Opening prayer	
10:15 – 10:20	Remark Prof. A. F. D. Kana, Head, Department of Computer Science, ABU, Zaria	
10:20 – 10:25	Opening Remark: Prof. I. Abdulkadir, Dean, Faculty of Physical Sciences, ABU, Zaria.	
10:25 – 10:35	Goodwill messages	
10:35 – 10:45	Welcome Address: Prof. Adamu Ahmed, Vice Chancellor, ABU, Zaria	
10:45 – 11:15	Guest Speech: Kashifu Inuwa Abdullahi, DG/CEO, National Information Technology Development Agency (NITDA) Title: <i>Harnessing Artificial Intelligence for Secure and Sustainable Digital Transformation in Emerging Economies.</i>	
11:15 – 11:40	Group Photograph and Tea Break	
11:40 – 12:05	Keynote Speech 1: Prof. Tutut Herawan, Universiti Malaya, Malaysia Title: <i>A Soft Computing Approach for Conflict Analysis</i>	
12:05 – 12:35	Keynote Speech 2: Dr Sadiq Sani, University of Greenwich, United Kingdom Title: <i>Securing the Digital Future: Harnessing AI and Cybersecurity for Sustainable Growth in Emerging Economies.</i>	
12:35 – 13:05	Keynote Speech 3: Prof. Aisha Abdulkadir, Ahmadu Bello University, Zaria, Nigeria. Title: <i>Smart Agriculture: Leveraging Artificial Intelligence for Sustainable Food Systems in Emerging Economies</i>	
13:05 – 13:35	Keynote Speech 4: Prof. Ezugwu E. Absalom, North-West University, South Africa. Title: <i>Advancing Sustainability through Nature-Inspired Computing in Logistics, Infrastructure, and Precision Agriculture</i>	
13:35 – 13:50	Interactive Session	
13:50 – 14:00	Presentation of Award to Invited Speakers, Sponsors & Collaborators	
14:00 – 14:05	Vote of thanks/Announcements: Prof Mohammed Abdullahi (Chairman, Conference Organizing Committee, ICCAIT'25)	
14:05 – 15:00	Lunch Break and Closing Day 1	

**Wednesday, November 19, 2025**  
**Day 2: Technical Session**

<b>Time</b>	<b>Activity</b>	<b>Venue</b>
<b>08:00 – 09:00</b>	Registration	LH1, LH2 & LH4, Department of Computer Science, (Site II), ABU, Zaria
<b>09:00 – 10:30</b>	Parallel Session I: Tracks: <ul style="list-style-type: none"> <li>▪ Computing and Intelligent Systems</li> <li>▪ Emerging Technologies</li> <li>▪ Information Systems and Applied Computing</li> </ul>	
<b>10:30 – 11:00</b>	Tea Break	NITDA IT Hub, ABU, Zaria
<b>11:00 – 13:00</b>	Parallel Session II: Tracks: <ul style="list-style-type: none"> <li>▪ Computing and Intelligent Systems</li> <li>▪ Emerging Technologies</li> <li>▪ Information Systems and Applied Computing</li> </ul>	LH1, LH2 & LH4, Department of Computer Science, (Site II), ABU, Zaria
<b>13:00 – 14:00</b>	Lunch Break	NITDA IT Hub, ABU, Zaria
<b>14:00 – 16:30</b>	Parallel Session III: Tracks: <ul style="list-style-type: none"> <li>▪ Computing and Intelligent Systems</li> <li>▪ Emerging Technologies</li> <li>▪ Information Systems and Applied Computing</li> </ul>	LH1, LH2 & LH4, Department of Computer Science, (Site II), ABU, Zaria

**Thursday, November 20, 2025**  
**Day 3: Closing**

<b>Time</b>	<b>Activities</b>	<b>Venue</b>
<b>09:30 – 10:30</b>	Closing Ceremony: <ul style="list-style-type: none"> <li>▪ Presentation of Certificates</li> <li>▪ Vote of Thanks: Prof. A. F. D. Kana (Head, Department of Computer Science, ABU, Zaria.)</li> </ul>	Main Hall NITDA IT Hub, ABU, Zaria
<b>DEPARTURE * DEPARTURE * DEPARTURE</b>		

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