



Call for Papers for 2019 International Conference

Africa and the Fourth Industrial Revolution: Defining a Role for Research Universities

The African Research Universities Alliance (ARUA), in partnership with University of Nairobi, will host an international conference and workshops on 18-20 November 2019 under the theme “**Africa and the Fourth Industrial Revolution: Defining a Role for Research Universities**”. Interested persons are invited to express their interest in making relevant presentations by sending abstracts of their planned presentations, following the brief and guidelines below.

Synopsis of Conference

The world is being ushered into a new industrial future, which is set to change in a fundamental way, how people live daily. The Fourth Industrial Revolution will be fundamentally different from earlier industrial revolutions in its scope and complexity, as well as its scale. The rate, depth and breadth of the likely transformations promise to be disruptive to all industries everywhere, especially for their production systems, management as well as governance. It is not clear how its future will look, but clues about what will shape winners and losers are emerging. Clearly innovation is critical, but so also is the constant restating of shared values that safeguard our common humanity. One thing is certain; the future will be like nothing the world has seen before. To make the most of it will require coordinated effort of all stakeholders, including the public and private sectors, academia and industry, as well as civil society.

The Fourth Industrial Revolution is based on the electronics and information technology that characterized the third revolution and is distinguished by the merging of technologies, muddling the distinction between the cyber, physical and biological worlds. The Internet of Things (IoT) offers the prospect of connecting billions of people, animals and objects each with a device with phenomenal processing power and storage capacity. This will unleash an unparalleled amount of data, which can be analyzed for unlimited knowledge. Advances in the fields of artificial intelligence, robotics, wireless communication, instrumentation, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing will have a multiplicative effect on progress made.

The impact of artificial intelligence is already evident with drones, self-driving cars and trains, virtual experts in the fields of medicine, law, investment, etc. This progress has been made possible by the rapid advances in the field of computation and the ability to analyze vast amounts of data very quickly in a way that was hitherto unimaginable. The range of applications for computing technology is wide, covering predictive algorithms, drug discovery, reconstruction of archaeological artifacts and many more. Nanotechnology is now making its way into the biological sphere, pioneering a symbiosis of human body, microorganisms, food and the built environment. A new world is being created; virtual reality, where there is a blurring of lines between the physical world and the virtual world.

The Fourth Industrial Revolution is going to yield new products and services. Undoubtedly it is expected to raise standards of living and income levels globally. It will increase efficiency and productivity at the work place. Transportation and communication costs will drop dramatically, hence delivering huge dividends to the supply-chain, opening up new markets and driving economic growth. Work and leisure will look different. Those who stand to benefit the most are those societies and individuals who can gain access to and leverage digital technology.

It is feared by many though that this revolution could create greater inequality and disrupt the labour market as machines increasingly take over from humans. This will imply that many jobs will cease to exist in the near future. A result of this is likely to be increases in social tensions with some segments having high skill/high paying jobs while other segments have low skill/low paying jobs. A disillusioned workforce with little confidence and fearful of the future could result with serious security implications. This could further deepen the 'winner takes all' economy. History shows that with any innovation the beneficiaries are the innovators, investors, stakeholders and those who provide the intellectual content. This scenario will be replicated across countries and regions. Social media has made the world a smaller place, enabling cross cultural interactions and exchange of ideas. While this is to be welcomed, there is also the danger that it could help fuel social unrest as happened during the Arab spring. Its impact is expected to be wide ranging, on government, business, people, education, health, agriculture and many more.

Given the transformative nature of the Fourth Industrial Revolution, developing nations should be asking important questions about what they bring to the table and niches they can carve for themselves for material and political gain. African universities should be preparing to ask questions and to offer answers to questions that are already being asked in this regard.

The ARUA 2019 conference aims to bring together international expertise from academia, government, industry, as well as from civil society to deliberate on the issues and pave the way for nurturing and supporting the Fourth Industrial Revolution in Africa. It will focus on how African universities can lead the way in the areas of teaching and research. How should universities prepare the student for the digital future? What research will support the production of goods and services in Africa in the new digital age? What relevant research will generate answers to questions about how to deal with the fall-out from the new revolution?

Conference structure

The main conference will take place over two days, 18-19 November, followed by several one-day workshops on 20 November 2019, driven by ARUA Centres of Excellence. The two-day international conference is designed to attract up to 250 participants from all over the world, but with about a half of the participants from ARUA member universities.

There will be 2 plenary and 10 parallel sessions on each day, covering specific relevant thematic areas of interest to ARUA¹. The 13 ARUA thematic areas will have slots at the parallel sessions with a view to mapping out expectations of how the Fourth Industrial Revolution will play out in the particular thematic, area and how African universities could prepare for that. Other thematic areas to be discussed will include:

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| Education | Communication and Society |
| Health Care | Security and Defence Blockchain |
| Agriculture | Production |
| The Built Environment and | Regulation |
| Transportation | International Diplomacy |

Venue

The conference will take place in Nairobi

Outputs

The conference is expected to lead to at least two edited volumes, one for the natural and physical sciences and another for the social sciences and humanities. It is planned to publish special editions of known international journals for ARUA Centre of Excellence. The conference will additionally produce a 'think-piece' to be shared with African university Vice Chancellors and governments on 'preparing for the fourth industrial revolution'.

Submission of Abstracts and Papers

Interested persons are invited to submit a one-page abstract of the papers they would like to present as a PDF attachment to arua@ug.edu.gh before 31st March 2019. Successful applicants will be informed about the decision on their abstracts and the method for submission of full papers within 14 days. Full papers are expected in by 30th September 2019.

Funding

ARUA will provide limited travel support to successful African presenters.

¹ These are Climate Change, Food Security, Water Conservation, Renewable Energy, Materials Development and Nanotechnology, Non-Communicable Diseases, Migration and Mobility, Poverty and Inequality, Unemployment and Skills Development, Good Governance, Post-Conflict Societies, Urbanisation and Habitable Cities, and Notions of Identity.