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Master classes Data Science & AI



 **KARUME INNOVATION HUB**
VLIR-UOS IUC Ardhi University

Training Dates

26th November – 2nd December 2023

Place

Karume Institute of Science and Technology – Zanzibar – Tanzania

Registration link

[Microsoft Forms](#)



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About Applied Human Machine Intelligence in East Africa - AHUMAIN

Mission

Our mission is to bridge the Artificial Intelligence gap in East Africa by Knowledge Sharing, Research and Development, Collaboration and Partnership, Capacity Building.

Vision

To empower East Africa with cutting-edge AI technologies, fostering innovation, and driving sustainable development. We envision a future where AI solutions are seamlessly integrated into various industries, enhancing efficiency, productivity, and quality of life for individuals and communities.

Core values

Inclusivity: Commitment to diversity, recognizing that innovation thrives with different backgrounds.

Ethics: Strict adherence to ethical standards in AI.

Sustainability: Focus on sustainable AI solutions with positive impacts on society.

Goals of the project

- Increasing the quality of education in applied AI and Data Science in East Africa by developing a specific curriculum in applied AI and Data science.
- Delivering the Specific hardware for deploying AI and Data Science applications
- Training and Teaching staff.
- Introducing new teaching methodologies.
- Increasing employability of students and supporting regional innovation and entrepreneurship.
- Networking between East Africa and European institutions and companies.
- Inclusion of minority groups.

<https://ahumain.africa>

About Karume Innovation Hub

ITP '23-'25

The goal of the International Training Program (ITP) is to implement an innovation hub, which can act as the central point of a new business ecosystem. This ecosystem will enhance the collaboration between all innovative parties in Zanzibar,



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will create a multidisciplinary community for learning and research and will act as an incubator to facilitate start-ups and product development for new and sustainable (digital) products.

During the 3-years project we will deliver following results:

- Installation of the innovation hub: establish procedures for application of ideas, create a virtual and physical workspace, provide the necessary equipment, install the administrative office
- Creation of the business ecosystem: organize network events, trainings on Tech (AI and IoT), Creativity and Business, seminars for business and governmental leaders, active recruiting of members through visits, calls, mailings...
- Market the region and the innovation hub through an extensive marketing plan, a website, social media accounts, brochures...s...
- Strengthen the collaboration between AP university college of applied Sciences and Arts and the Zanzibar region, to ensure a long-term partnership
- Provide internships for Belgian and African students in the innovation hub
- Put in place a selection procedure for new projects in the innovation hub and establish a “pay-it-forward” policy for successful start-ups. This means that we will ask a commitment of the successful starters to become a mentor for the new starters.

In the first 2 years, the focus will be on the Zanzibar Region (including all islands) to ensure a solid base for the innovation hub. In year 3, we will explore the possibilities of expanding the network to the Tanzanian mainland. Beyond the project, it is our ambition to extend the reach of the innovation hub to all of East-Africa.

<https://kih.kist.ac.tz>

About VLIR-UOS IUC Ardhi University

Building Capacity in Education, Research, Innovation and Societal Outreach to Foster an Inclusive and Sustainable Built Environment in a Rapidly Urbanizing City, Dar Es Salaam (SDG 11 In Dar Es Salaam)

Ardhi University (ARU) proposes to develop an African Centre for Sustainable Cities Studies (ACS1) in order to (i) build capacity in education and training, research, innovation and societal outreach to contribute in generating solutions to these challenges and contribute to the sustainable growth of Dar es Salaam and its wider region in line with the Sustainable Development Goals (SDGs) in general and SDG 11 in particular, and (ii) realize the ambition of becoming an internationally recognized, inclusive, civic university that responds to societal and environmental problems.

The project is composed out of 7 sub-projects:



1. Land use planning - Participatory planning and land-based resource use conflict management for sustainable growth of Dar es Salaam metropolitan and its region
2. Decent housing - Towards improved urban water supply and sustainable sanitation resource recovery, sustainable energy and material uses for decent housing
3. Socio-economic development - Increasing the sustainability of urban foodscapes through agri-food entrepreneurship
4. Urban transport - Safe, inclusive and sustainable urban transport system
5. Cultural heritage - Architectural Heritage Conservation through Adaptive Reuse: Assessing Design, New Functions, Construction Techniques and Cost Benefits
6. Gender and participation - Towards gender-equitable and inclusive urban development (transversal institutional strengthening project)
7. ICT and SSIC - Improving Capacity to Innovate Smart ICT Solutions and Support Technology Transfer for Smart Sustainable and Inclusive Cities (transversal institutional strengthening project)

Data Science and AI training

This training is organized in the frame of three projects:

- Building Capacity in Education, Research, Innovation and Societal Outreach to Foster an Inclusive and Sustainable Built Environment in a Rapidly Urbanizing City, Dar Es Salaam (SDG 11 In Dar Es Salaam) - VLIR-UOS IUC.
- AHUMAIN - Applied Human Machine Intelligence - Erasmus+ KA2 Capacity Building in the field of Higher Education
- VLIR-UOS International Training Program (ITP) with Karume Institute of Science and Technology

For all projects, it is important to train teaching staff in an early stage in the field of Data Science, AI and Smart Cities, the possibilities, the challenges and the technical repercussions. At the same time delivering these courses to consortium members and also including local labour market and government, will be useful for dissemination of the project's results beyond the consortia.

The training will provide an introduction to AI, after which various ML techniques will be covered, theoretically and in practice. To ensure relevance, a real use case is covered, concerning air quality.



Smart Sustainable and Inclusive Cities

In addition to the e-learning workshop, the concept of Smart Sustainable and Inclusive Cities is also presented and assessment tools determined. We see a rapid growth in many African metropolitan areas, like Kampala and Dar es Salaam. Growth is often due to the opportunities which are ample in these cities and the attraction is has on the rural population. At the same time it comes with many challenges. Ardhi University (ARU) proposes to develop an African Centre for Sustainable Cities Studies (ACS1) in order to build capacity in education and training, research, innovation and societal outreach to contribute in generating solutions to these challenges and contribute to the sustainable growth of Dar es Salaam and its wider region in line with the Sustainable Development Goals (SDGs). Also in other cities municipalities are looking at academic partners to find innovative ways to solve many of the existing challenges.

Internationalization

In parallel to the workshops, an workshop is delivered on internationalization strategy, procedures and implementation, to allow more intense academic cooperation between European and African universities.

The following topics will be covered:

- Incoming Student Mobility
- Outgoing Student Mobility
- Incoming Staff Mobility
- Outgoing Staff Mobility
- International Projects
- International Curriculum
- International Agreements
- International Competencies
- Overview International Projects
- Overview International Partners

From all aspects the workshop will cover: description, justification, KPIs, needs, opportunities, hindrances, risks, mitigation.



Agenda

Data Science & AI – Smart Sustainable and Inclusive Cities

Saturday 25/11/2023	Arrival KIST - Zanzaibar - Tanzania – Prepare workshop
Saturday 25/11/2023	Prepare workshop
Monday 27/11/2023 9h30-11h00	Introduction: presentation AHUMAIN – ITP – Karume Innovation Hub
Monday 27/11/2023 11h15-12h30	Workshop Smart Cities
Monday 27/11/2023 13h30-16h30	Intro AI - ML Canvas
Tuesday 28/11/2023 9h30-12h30	ML Regression
Tuesday 28/11/2023 13h30-16h30	ML Regression practical session
Wednesday 29/11/2023 9h30-12h30	Logistic regression / cross validation
Wednesday 29/11/2023 13h30-16h30	Logistic regression / cross validation practical sessions
Thursday 30/11/2023 9h30-12h30	Decision tree
Thursday 30/11/2023 13h30-16h30	Decision tree practical session
Friday 01/12/2023 9h30-12h30	Deep Learning intro / use case - air quality
Friday 01/12/2023 13h30-16h30	Use case - air quality
Saturday 02/12/2023	Conclusion, closing remarks, feedback and future work - visit external stakeholders - local context



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Internationalization

Saturday 25/11/2023	Arrival KIST - Zanzaibar - Tanzania – Prepare workshop
Saturday 25/11/2023	Prepare workshop
Monday 27/11/2023 9h30-12h30	Workshop Smart Cities
Monday 27/11/2023 13h30-16h30	Student mobilities - strategy
Tuesday 28/11/2023 9h30-12h30	Student mobilities – local input
Tuesday 28/11/2023 13h30-16h30	Staff mobilities - strategy
Wednesday 29/11/2023 9h30-12h30	Staff mobilities – local input
Wednesday 29/11/2023 13h30-16h30	International projects – strategy & overview
Thursday 30/11/2023 9h30-12h30	International projects – strategy & overview – local input
Thursday 30/11/2023 13h30-16h30	International agreements – strategy & overview
Friday 01/12/2023 9h30-12h30	International agreements – strategy & overview – local input
Friday 01/12/2023 13h30-16h30	Use case - air quality
Saturday 02/12/2023	Conclusion, closing remarks, feedback and future work - visit external stakeholders - local context



Trainers

Wouter Gevaert

Ir. Wouter Gevaert is a lecturer at Howest in the Multimedia & Creative Technologies (MCT) program. His lectures include machine learning, deep learning and reinforcement learning. He is a former researcher within the field of Artificial Intelligence at the STAR Lab research group (Howest).

Wouter provides freelance (SenseML) consulting and custom AI related trainings to companies.

He is co-founder of Unpyle (www.unpyle.ai). Unpyle realizes and integrates complete AI solutions.

<https://www.linkedin.com/in/wouter-gevaert-649bb051/?originalSubdomain=be>

Wim Casteels

Dr. Wim Casteels is coordinator of IT & AI and researcher at the IT department of the AP University of Applied Sciences and Arts in Antwerp. He has a background in theoretical physics in which he obtained a PhD for studying the quantum behavior of ultracold atoms. More recently he started working in the field of data science and AI, first as a data scientist in industry before returning to the academic world where he is currently exploring various AI related topics such as Learning Analytics and digital customer journeys.

<https://www.linkedin.com/in/wim-casteels-213720b4/>

Tom Peeters

Tom Peeters graduated as a Master of Industrial Sciences, specialized in Electronics-ICT. He started in 2003 as a software engineer and project manager for Agfa-Gevaert. Since 2009 he is lecturer software engineering and virtual reality for at AP University of Applied Sciences and Arts. He is also responsible for the international collaboration projects of the IT program. Therefore he also was guest professor in Finland (Oulu), Austria (Skt-Pölten), etc.

Besides he is a senior researcher and has worked on several projects, such as Show & Tell! Immersive Storytelling (a multidisciplinary project concerning VR, AR, 360° video).

Currently he is the coordinator of the VLIRUOS ITP project “Expert training in IOT and AI for product development in East Africa”.

<https://www.linkedin.com/in/tom-peeters-9312a73/>



Dirk Van Merode

Ing. Dirk Van Merode MSc finished his engineering studies in Electronics back in 2002. After his studies, he found his passion in learning, developing, teaching and preaching technology, as a researcher, lecturer and international projects coordinator. Having worked in several other higher educational institutes, Dirk now works as a lecturer and research engineer at AP University of Applied Sciences and Arts in Antwerp.

His field of expertise is in Internet-of-Things, digital systems design, printed circuit board design and production, embedded systems and audio-video production. Research topics are mainly in European projects, both on curriculum development and student and staff mobility with countries outside the EU. He did research in space applications and satellite development for a couple of years.

He was partner and coordinator of numerous international projects.

He was guest professor and advisor in numerous European, Asian and African universities.

Dirk is currently coordinator of AHUMAIN: Applied Human Machine Intelligence in East Africa and was coordinator of ACTEA: Applied Curricula in Technology for East Africa (www.actea.net).

Dirk is also partner in in Erasmus+ KA2 SPACECOM: New study program in space systems and communications engineering (<https://spacecom.uz/en>).

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