United Nations University
International Institute for Software Technology

UNU Macau

UNU Macau Training Portfolio

2024

UNU Macau is a UN think tank that focuses on research concerning digital technologies for sustainable development. It also helps transform the digital future of the UN system and member states through learning and capacity development.

Introduction of UNU Institute in Macau

Founded in 1992, the Institute has trained thousands of people from all over the world. Some of them are now ministers of ICTs from the Global South, presidents of universities, senior government officials, and UN managers.

As an academic member of the UN family specialised in digital technologies, UNU Macau has brought forward many insightful research contributions for evidence-based and data-driven decision-making and policy development. Our recent research on the ethics of AI, cyber resilience, and modelling to prepare for the next pandemic are some key examples.

We believe that research and training should always go hand in hand. Research makes our training content more fresh, applicable, contextualised, up-to-date, and alive. Training reinforces research, as more ideas emerge during the interactions with learners. The virtuous cycle keeps us energised and sought after in the UN system, by the member states, NGOs, and private sector.

UNU Macau consists of a dynamic, multi-disciplinary and multi-cultural team of international researchers and professors. Moreover, they have deep knowledge about the UN and the digital realities faced by member states.

UNU Institute in Macau is situated in Macau Special Administrative Region (S.A.R.), China. Our office is in Casa Silva Mendes, a beautiful cultural heritage building built in 1905 that once belonged to Manuel da Silva Mendes, a renowned writer and art collector.

Old photograph of Casa Silva Mendes.

Located in the Greater Bay Area of China, the Institute has access to new technologies and innovation, forward-leaning technology industry partners, and diverse academia and NGOs from the region. Macau's central location enables easy transportation to mainland China, Hong Kong S.A.R., and other Asian countries, such as Japan, South Korea and Thailand.

UNU Macau, formerly known as the International Institute for Software Technology (UNU-IIST), is grateful for the 30 years of generous support of its host governments.

UNU Macau will continue to lead research and training to build a sustainable digital future for all.

What we do

Policy-relevant research to support evidence-based decision-making on digital technologies for sustainable development.

Capacity development and training on digital technologies for sustainable development for the UN system and the Global South.

Global convening of UN Member States, UN entities, regional bodies, NGOs, academia, and the private sector to unlock the potential of digital technologies for sustainable development.

Our research focus

The Institute works collaboratively with its partners to co-create research projects across diverse thematic areas, such as:

- Responsible Artificial Intelligence
- Gender and technology
- Digital health and wellbeing
- Participatory modeling

Target audience and training themes

Our courses are targeted at a range of audiences across all levels from government officials, UN staff and managers, those working in NGOs, as well as interested private sector employees and youth. These courses can be run across a variety of modalities including in-person, online, and hybrid. We work with individuals and organizations to provide the best fitting training solutions.

Overview

Section I
Digital Technology for the 2030 Agenda

1 Understand the United Nations and Sustainable Development Goals

2 Digital Technology and Sustainable Development

3 Understand and Engage Digital Technology to Build a Sustainable Future

4 Life Online: Mitigating Risks and Maximising Opportunities for Health and Wellbeing in Cyberspace

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Section I

Digital Technology for the 2030 Agenda

1

Understand the United Nations and Sustainable Development Goals

Founded in 1945 and currently made up of 193 Member States, the United Nations is an intergovernmental organization providing a place where all the world's nations can gather together, discuss common problems, and find shared solutions that benefit all of humanity. As evolved over the years, the United Nations has also served as a forum to address issues that transcend national boundaries[1]. The 2030 Agenda for Sustainable Development, unanimously adopted by all United Nations Member States in 2015, serves as a shared blueprint for peace, prosperity, and sustainability for people and the planet. At its core are the 17 Sustainable Development Goals (SDGs), which urgently call for action by both developed and developing countries. These goals aim to address interconnected global challenges, emphasizing that poverty eradication, improved health and education, reduced inequality, and economic growth must go hand-in-hand with efforts to combat climate change and protect our oceans and forests[2]. This course aims to develop a comprehensive understanding of the United Nations and its evolving role in addressing global challenges in local and global contexts. Participants will also deeply learn about the United Nations 2030 Agenda for Sustainable Development and SDGs, achievements and challenges in building a sustainable future, and how we can lead sustainable actions towards SDGs.

Subtopics

- The role of United Nations in the contemporary world
- UN's responses to global pressing challenges: rules, norms, and ideas
- Millennium Development Goals, Sustainable Development Goals and 2030 Agenda for Sustainable Development

Expected outcomes

- Understand the processes that culminated in the 2030 Agenda for Sustainable Development
- Knowledge of each of the 17 SDGs, including awareness of the related targets and indicators
- Understand the role of United Nations in building a sustainable future for all
- Awareness of major achievements and ongoing challenges in realizing the SDGs
- Appreciation of the various approaches that different stakeholders employ to contribute to the achievement of the SDGs

1 Source: https://www.un.org/en/about-us

2 Source: https://sdgs.un.org/goals

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Digital Technology and Sustainable Development

Digital technologies have advanced more rapidly than any innovation, reaching around 50% (see Digital Cooperation report) of the developing world's population in only two decades. Digital technologies are transforming governments, economies, and societies. They have the potential to play a catalytic role in supporting the global community to achieve the 2030 Agenda – the 17 Sustainable Development Goals (SDGs). This course will highlight the wide-ranging importance of digital technologies and their impact on the SDGs. This course will also explore the uses and impacts of new technologies within international organizations by using a conceptual framework including technology maturity, ethics, and impact on beneficiaries. Participants will learn how these technologies are used in promoting sustainable development, what their advantages are, and what current risks and challenges are.

Subtopics

- Harness digital solutions for sustainable development
- Opportunities, challenges, and risks of digital transformation for achieving SDGs
- AI and its impact on SDGs: smart cities, digital twins, IoT, robotics
- Ethics, policy, and environmental practices related to new technologie

Expected outcomes

- Understand digitalization issues and the impact of digital technology on the Sustainable Development Goals
- Understanding of new technologies and their application in promoting sustainable development contexts at local, regional, and global levels
- Critical thinking and ability to assess the relevance and usefulness of digital technologies for achieving SDGs
- Understanding of the connection between new technologies, data, and more mature technologies.
- Awareness of opportunities, challenges, and risks of digital solution for achieving SDGs

3

Understand and Engage Digital Technology to Build a Sustainable Future

Digital technologies are transforming our lives in many ways. We can use digital technologies to reduce poverty, increase decent work, and universalize literacy which are key components to a sustainable future that is marked by fairness, peace, justice, and equality. But digital technologies can also threaten privacy, erode security, and fuel inequality. They have implications for human rights[1]. The rapidly evolving AI has profoundly changed the media that we use for accessing information, entertaining, and educating. Media powered by AI can enable people to be heard and connected easily; they can also reinforce existing bias and inequality by spreading hate speeches and disseminating misinformation and disinformation, as well as amplifying echo chambers. In our increasingly digitally connected world, how do we understand digital technologies critically? How do we engage in digital technologies effectively, responsively, positively, and ethically? How do we use digital technologies to actively engage in public life and shape a sustainable future for all? This training will focus on these questions, and explore approaches that we can use to unlock the potential of digital technologies to build a sustainable future.

Subtopics

- Digital technologies for sustainability
- Impact of digital technologies
- Digital technologies and literacy
- Digital inclusion

Expected outcomes

- Understand the interrelation between digital technologies and sustainability
- Knowledge and skills to use digital technologies to critically reflect information dissemination and meaning construction in the digital world
- Awareness of using digital technologies positively and responsively.
- Knowledge of engaging with digital technologies and how to use digital technologies to shape a sustainable future.

1 Source: https://www.un.org/en/un75/impact-digital-technologies

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Life Online: Mitigating Risks and Maximising Opportunities for Health and Wellbeing in Cyberspace

We have more opportunities than ever before to be connected to one another, to learn, to engage with media, and to be entertained through digital technologies. With this connection comes both positive and negative impacts on physical, mental, and social health. Omnipresent access to the internet is influencing the ways we live and work, and this has flow on effects to how we think, feel, and act. As we make progress in addressing the first level of the digital divide – the ability to access internet connected technologies – it is becoming clear that there the risks of engagement in online spaces have disproportionate impacts on marginalised and vulnerable groups. This course will examine features of computer-human interaction with a focus on highlighting issues of equity, health, and well-being of women, children, and those crisis and conflict affected areas. The concept of digital wellbeing will be introduced to help participants understand how to mitigate the risks and promote the benefits of online life for themselves and others. This course also seeks to examine how we can support, educate, and meaningfully include community in decision making and knowledge production concerning the impact of technology in society.

Subtopics

- Ecological models of wellbeing and the techno-subsystem
- Online life: Impacts on personal and collective wellbeing
- Digital wellbeing and the SDGs
- The digital divide

Expected outcomes

- Understand the multidimensional nature of wellbeing and the impacts of digital transformation across spheres of life
- Understanding of the features of computer-human interaction and how interactions with technology are changing social and personal life
- Awareness of digital wellbeing and how to support positive outcomes of technology including how digital wellbeing relates to the SDGs
- Awareness of the digital divide and how it impacts diverse, marginalised groups

Section II

Artificial Intelligence for Policy-makers

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Demystifying AI

Artificial Intelligence (AI) presents unprecedented opportunities for achieving the Sustainable Development Goals (SDGs) set in the 2030 Agenda for Sustainable Development. AI offers unparalleled potential to enhance efficiency, solve complex problems, and improve quality of life for individuals while driving innovation and progress for the whole world. However, an understanding of AI technology is crucial for supporting individuals and organizations to make well-informed decisions regarding its adoption and utilization. Consequently, this course aims to demystify artificial intelligence (AI) for participants with diverse backgrounds. From its historical roots to cutting-edge applications, the course covers the fundamental concepts of AI in a clear and accessible manner. Participants will gain insight into the AI development process, covering key stages from data collection to model deployment. The foundational concepts of machine learning are examined to provide an understanding of algorithms and their applications in relation to SDGs. Furthermore, the course explores generative AI fundamentals, uncovering how AI systems create new content. Finally, the course examines natural language processing (NLP) to illustrate how AI interprets and understands human language.

Subtopics

- A primer on what AI is and its various applications for the SDGs
- AI development process
- Machine Learning basics
- Generative AI fundamentals
- Natural Language Processing

Expected outcomes

- Ability to explain AI technologies and how they are used to support humanitarian action, sustainable development, and peace processes
- Ability to explain AI development phases, from problem definition and data collection to model training, evaluation, and deployment
- Understanding of machine learning algorithms, including supervised, unsupervised, and reinforcement learning
- Understanding of the basic principles and techniques behind generative models
- Understanding of how AI processes and understands human language

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Responsible AI

Artificial intelligence has profound significant influence on societies and ecosystems, shaping human cognition, interactions, and decision-making. While AI offers opportunities to accelerate progress towards Sustainable Development Goals and common agendas, its deployment poses risks, including malicious misuse and widening socio-economic disparities. Key ethical considerations such as privacy, inclusivity, transparency, and accountability are therefore essential in providing a foundation for responsible AI development and deployment. This course highlights key principles of responsible AI necessary in fostering trust and ethical use of AI systems. Consideration of gender perspectives in building AI systems is also explored - ensuring that the developed systems are sensitive to gender-related biases, promote diversity and representation, and contribute to more equitable outcomes for all users. The course also explores real-world case studies and best practices of developing responsible AI solutions for the good of humanity.

Subtopics

- Risks, harms, and challenges posed by AI
- AI transparency, accountability, explainability, and privacy
- AI and gender
- AI risk assessment tools

Expected outcomes

- Awareness of the potential societal impact of AI and the underlying principles of responsible AI
- Understanding of gender perspectives in creating inclusive and equitable AI systems
- Ability to understand and analyze ethical dilemmas and considerations inherent in AI development and deployment
- Familiarity with the tools for AI risk assessment

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AI Governance

As AI adoption expands to drive innovation across various sectors, it becomes imperative to set strategies to mitigate its potential downsides and repercussions on a global scale. Consequently, the need for global AI governance has been stressed by the UN and its Member States. AI governance aims to promote transparency, trust, minimize risks, and maximize the societal benefits of AI while safeguarding against potential harms and abuses. This course offers an in-depth exploration of AI governance, highlighting regulatory frameworks and guiding principles. Participants will gain insights into the implications of existing global and regional regulations on businesses and society - fostering an understanding of AI governance dynamics. Moreover, the course aims to equip participants with practical skills to develop effective AI governance frameworks, considering factors such as cultural nuances and community values.

Subtopics

- The AI governance and regulatory landscape
- AI governance principles
- Opportunities and challenges related to AI governance
- Designing and implementing AI governance frameworks

Expected outcomes

- Understanding of the current AI governance and regulatory landscape and what is on the horizon
- Understanding of the importance of AI governance principles and the strategies for promoting such principles throughout the AI lifecycle
- Understanding of how to design and implement AI governance frameworks, considering factors such as culture, processes, and technologies

Section III

Data for Sustainable Development

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Data for Sustainable Development

The achievement of the Sustainable Development Goals (SDGs) requires the presence of high-quality, timely, and reliable data, which is crucial for generating relevant SDG indicators and other statistics. The course aims to strengthen the knowledge and capacities of data producers and data users to ensure an effective use of data for the SDGs. It will showcase techniques, best practices, and tools in selecting, creating, using, and interpreting data in support of the 2030 Agenda for Sustainable Development. Participants will learn how to assess the quality, reliability, and timeliness of data, and how to effectively utilize data to monitor and measure progress towards SDGs. The course also examines strategies for data disaggregation to ensure inclusivity and equity in development efforts including gender equity. Lastly, the course will examine the opportunities and challenges presented by digital technologies in data collection, analysis, and dissemination.

Subtopics

- Foundations of data for sustainable development.
- Data for SDG Monitoring and Evaluation
- Data Governance and Ethics
- Analyzing data with a gender angle
- Emerging Trends and Technologies in Data for Sustainable Development
- Using data for policymaking

Expected outcomes

- Solid understanding of sustainable development and the role of data in achieving SDGs.
- Understand of how to effectively utilize data to monitor and measure progress towards SDGs.
- Knowledge of data governance and ethical frameworks, and strategies for ensuring privacy and security
- Acquire practical skills in data analysis from a gender perspective.
- Understand the opportunities and challenges presented by digital technologies in data collection, analysis, and dissemination.
- Understanding of how to use data for policy making and promoting equity in sustainable development efforts.

9

Data Privacy, Protection, and Ethics

The data revolution was recognized as an enabler of the Sustainable Development Goals, not only to monitor progress but also to inclusively engage stakeholders at all levels to advance evidence-based policies and programmes and to reach the most vulnerable. The 2030 Agenda asserts that "Quality, accessible, timely and reliable disaggregates data will be needed to help with the measurement of progress (SGDs) and to ensure that no one is left behind. Such data is key to decision making."

At the same time, there are legitimate concerns regarding risks associated with handling and processing of digital data, particularly in light of the current fragmented regulatory landscape and in the absence of a common set of principles on data privacy, ethics and protection. These concerns continue to complicate efforts to develop standardized and scalable approaches to risk management and data access.

Reaffirming that the right to privacy is a fundamental human right and recognizing the social value of data, including the value of disaggregated SDG indicators with regard to the implementation of the 2030 Agenda, this course aims to provide a harmonized general framework for accountable, adequately transparent, and responsible data handling practices.

Subtopics

- Potential risks and harms that can result from digital data use
- Data privacy and protection principles endorsed by the United Nations Development Group
- Risks, harms, and benefits assessment tools
- Existing regulations, rules, and policies concerning data privacy, data protection, data ethics, and data security

Expected outcomes

- Understanding key concepts and terminology related to data privacy, protection, and ethics to inform decisions
- Ability to understand data privacy and protection principles for obtaining, retention, use, and quality control of data from the private sector
- Familiarity with tools to help identify and minimize the risks of harm and maximize the positive impacts of data innovation projects

10

The Use of Synthetic Data for Training AI Models - Introduction to Policy-makers

Data is critical at all stages of artificial intelligence development, especially during the training and testing phases. Synthetic Data (SD) is information created by computer simulations or algorithms that reproduce some structural and statistical properties of real-world data. Data produced by this "synthesis" process can be images, videos, text or tabular data. It is argued that 60% of the data used for AI systems will be synthetically generated as soon as 2024. Using synthetic or artificially generated data in training AI algorithms is a burgeoning practice with significant potential. It can address data scarcity, privacy, and bias issues and raise concerns about data quality, security, and ethical implications. This issue is heightened in the global South, where data scarcity is much more severe than in the global North. (see https://unu.edu/sites/default/files/2023-09/UNU-Policy-Brief_1-2023_The-Use-of-Synthetic-Data-to-Train-AI-Models.pdf)

Subtopics

- Brief introduction to Artificial Intelligence. What are Generative AI models and how they differ from traditional AI systems?
- What is Synthetic Data?: This section will introduce the concept and definition of synthetic data, as well as the methods and techniques for generating it. It will also cover the advantages and disadvantages of synthetic data compared to real-world data, and some use cases and applications of synthetic data in various domains and sectors.
- Ethical and Legal Issues of Synthetic Data: This section will explore the ethical and legal aspects of synthetic data. It will discuss the potential risks and harms of synthetic data, such as bias propagation, data quality, security risks, misuse and data pollution, and how to mitigate them.
- Overview of the United Nations University Synthetic Data Policy recommendations for practitioners and policymakers.

Expected outcomes

- Understand what synthetic data is and how it is generated,
- Understand the potential of synthetic data to accelerate the attainment of the SDGs through AI in the Global South while mitigating ethical risks,
- Apply best practices and guidelines for using synthetic data in their contexts.

11

Global Digital Compact

Digital technologies are dramatically transforming our world. They offer immense potential benefits for the wellbeing and advancement of people, societies, and for our planet. They hold out the promise of achieving the Sustainable Development Goals.

The Common Agenda proposes a Global Digital Compact to be agreed at the Summit of the Future in September 2024 through a technology track involving all stakeholders: governments, the United Nations system, the private sector (including tech companies), civil society, grass-roots organizations, academia, and individuals, including youth.

The Global Digital Compact is expected to "outline shared principles for an open, free and secure digital future for all". The Common Agenda report suggests issues that it might cover, including digital connectivity, avoiding Internet fragmentation, providing people with options as to how their data is used, application of human rights online, and promoting a trustworthy Internet by introducing accountability criteria for discrimination and misleading content.

Subtopics

- Digital divides and digital inclusion
- Engagement and partnership with the public sector, private sector, technical and academic institutions, and civil society
- Opportunities and challenges to govern emerging technologies

Expected outcomes

- Understanding of the digital world divides (data divide, innovation divide, governance gap, and value divide)
- Understanding digital cooperation, actors, and the global digital compact: Reaping benefits and mitigating risks
- Understanding of how to implement the Global Digital Compact at the local level

Section IV

Computational Tools for Foresight

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Agent-Based Models for Better Health Policies

Multiple social and environmental systems on the planet are experiencing massive stresses leading to migration, poverty, and displacement, among other issues. Governments and international organisations decisions on policies and investments need to be better informed, and this can be achieved by using integrated models where citizens are more involved, so policies are more relevant and accepted. The objective of such models is to provide a realistic, simplified representation of reality. This can be as simple as a map to understand the optimal way to travel or as complex as a climate change model that integrates various societal or environmental perspectives across different times or geographical scales. Governments use modelling in their decisions all the time, but often these models are too narrow and lead to unsustainable decisions because environmental damage or social harm are not considered.

This course will help decision-makers to understand the complex connections and interactions between the Sustainable Development Goals and environmental, social, and economic parameters included in integrated models. Concrete examples in public health will be provided such as: COVID-19 models in their role in public health policies, and how to engage communities in the design of public health models and policies.

Subtopics

- Complex systems and wicked problems
- Models that serve the society
- Black swan events, black box problem
- Agent-Based Models for public health policies
- Participatory modelling

Expected outcomes

- Understanding of situations where models/social simulation can be applied
- Understanding of the uses and limitations of models for decision-making in the context of SDGs and sustainability
- Ability to engage stakeholders and citizens in the design of large-scale models using participatory approaches such as role-playing games and computer simulations

13

Introduction to Behavioral Science & Digital Tech

To make progress towards meeting the Sustainable Development Goals, tools, insights, and methods from behavioural science can be utilised to maximise the impacts of policies and programmes. Behavioural science uses evidence-based methods to the study human behaviour in ways that can help us to understand individual and social decision making as well as investigate how and why people respond to programmes, policies, and incentives in particular ways. Digital technologies have allowed for advances in the way we communicate and interact with others, meaning that the hold many possibilities and potential challenges for applying behaviourally based insights. This course will cover the major concepts within behavioural science and consider the use of new and emerging technologies on capturing behavioural insights and promoting behaviour change.

Subtopics

- An introduction to behavioural science
- The psychology of behaviour and behaviour change
- Behavioural science in the context of policy
- Agent based modelling
- Predictive analytics and ethics
- Data driven insights and behaviour change

Expected outcomes

- Understanding of behavioural science and the psychology behind behaviour change
- Ability to recognise the importance of behavioural science in policy
- Understanding of new tools and technologies for behavioural insights
- Awareness of the opportunities and risks of digital technologies for behavioural insights and behaviour change

Team

Meet Our Researchers

*In alphabetical order.

Jingbo Huang

Director

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Education

Columbia University
Ed.D in Computing, Communications and Technology in Education

Institut d'Etudes de Grenoble
Masters in Arts Administration

Indiana University-Bloomington
MA in French

Peking University
BA in French & Economics

Jingbo Huang is an educational technologist, researcher, coach, manager, and leader. She has been leading the United Nations University Institute in Macau in the past four years, during which, she led the multidisciplinary research team and the talented operations team to fundraise, conduct policy-relevant research and deliver high quality training programmes for the UN system and member states.

In her 20 years of UN career, she has held various managerial positions in the UN, UNDP, UNESCO and UNSSC, specialised in the learning design and staff development for UN system staff and managers. She used to design and develop UNDP RR/RC programmes and previously led the team that founded the UN system executive management programmes at UNSSC, which quickly became the UN system standard. She is also a certified coach and has been coaching her peer UN colleagues along their career journeys. She is a career advisor and visiting professor at the Sun Yat-sen University since 2007.

Research Interests

- Educational technologies (e.g. video-based learning)
- Adult learning, and learner-centred design
- Staff development/learning and coaching

Ronald Musizvingoza

Researcher

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Education

Uludag University

PhD, Sociology

University of Zimbabwe

Master, Population Studies

National University of Science and Technology, Zimbabwe

Honors Degree, Operations Research and Statistics

Ronald Musizvingoza is a Social Scientist and Researcher at UNU Macau, whose work falls at the intersection of gender equality (SDG5), health, and well-being (SDG3) and digital technology.

With a PhD in Sociology, Ronald Musizvingoza focuses on generating evidence for research and policy, emphasising the translation of evidence to policy and practice-based learning in LMICs.

Ronald's research interests include digital health, statistics, GBV, SRH, maternal health, and child development outcomes, addressing intersectional gender and socio-economic inequalities. His is interested in combining AI, big data, and digital approaches with traditional data, aiming to develop innovative methodologies using digital technology to monitor and advance SDGs.

Previously a Postdoctoral Fellow at UNU IIGH, Ronald led and contributed to projects aimed at generating evidence for policies advancing gender equality in digital health. These include research on the gendered dimensions of digital technologies, big data research on adolescents' SRH, capacity building for gender mainstreaming in health and digital literacy, and the implementation of the Health Sector Website Assessment Index Tool on Malaysian hospitals.

In Zimbabwe, Ronald conducted a comprehensive situational analysis of gender statistics, monitoring, and reporting systems. Additionally, he supported an evaluation of GBV programs, developed a digital best practice document for CSOs programming in Zimbabwe and protocols for reporting COVID-19 related stigma. Ronald has also contributed to UNICEF's work on social protections and violence against children in Burkina Faso and the development of the Mainstreaming Gender into ABS Value Chains toolkit at UNDP.

Research Interests

- Digital health
- Statistics
- GBV
- SRH
- Maternal health
- Child development outcomes

Ally S. Nyamawe

Researcher

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Education

Beijing Institute of Technology, China

PhD, Computer Science and Technology

The University of Dodoma

MSc, Computer Science

University of Dar es Salaam

BSc, Computer Science

Ally S. Nyamawe is a computer scientist and researcher at the United Nations University Institute in Macau.

Before joining UNU Macau, Nyamawe worked as a Senior Lecturer of Computer Science at the University of Dodoma, Tanzania, where he was engaged in teaching software engineering (SE) courses, researching the application of artificial intelligence in SE, and supervising master students. Since 2009, Nyamawe has served the University of Dodoma in different capacities including Coordinator of the Center for Innovation, Research, and Development in ICT and Head of the Computer Science Department from 2013 to 2015. Before that, Nyamawe worked at St. John's University of Tanzania as a Software Developer and Instructor from 2008 to 2009.

Nyamawe has served as the Principal Investigator of different projects through which he has been working towards accelerating AI uptake for sustainable development in Africa. With AI4D Research Lab, Nyamawe was leading a team of researchers in developing AI solutions for Healthcare and Agriculture, contributing to AI policy formulation in Tanzania, and supporting the development of AI-driven innovations for SDGs. Nyamawe has been working under Green Gaming project to foster 21st century skills among youths and university students. Particularly on the application of coding and algorithmic skills to solve social challenges. His recent recognition includes being a 2022 recipient of the Seed Grant for New African Principal Investigators awarded by The World Academy of Sciences under UNESCO funding.

He has served on the program committees for prestigious conferences including the 37th IEEE/ACM International Conference on Automated Software Engineering, 11th International Workshop on Software and Systems Traceability and the 1st International Conference on the Advancements of Artificial Intelligence in African Context (AAIAC 2023).

Nyamawe possesses extensive research experience in the application of Artificial Intelligence in Software engineering and has significant number of publications in reputable international journals and conferences. His research interests include Software Maintenance, Computer Programming, and AI for Social Good (AI4SG). He advocates for AI4SG, and explainable, inclusive, and responsible AI.

Research Interests

- Software maintenance
- Computer programming
- AI for Social Good (AI4SG)

Serge Stinckwich

Head of Research

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Education

Université Savoie Mont Blanc
PhD in Computer Science

Ecole Normale Supérieure de Lyon
Magister of Computer Science and Modeling

University of Grenoble I
MSc of Computer Science

Serge Stinckwich is a computer scientist and the Head of Research at the United Nations University Institute in Macau. Before joining UNU-Macau, he was an Associate Professor at the University of Caen Normandie (France) and a researcher in the UMMISCO international joint research unit of IRD (French Research Institute on Sustainable Development) at Sorbonne University.

Over the years, Serge has developed an innovative research programme on modelling and simulation of complex systems at the intersection of several scientific disciplines applied to developing countries' issues. His research interests are domain-specific languages and tools that ease the tasks of non-computer experts to model, simulate, and analyse complex systems. He has applied his work to Epidemiology, Environmental Monitoring and Disaster Management.

From 2008 to 2012, he worked in Hanoi, Vietnam, on the AROUND (Autonomous Robots for Observation of Urban Networks) programme, which deals with deploying simple mobile autonomous sensors during disasters in the context of southern countries. He has also been an invited Professor at Kyoto University to work with Japanese experts on Rescue Robotics.

In 2017, he was based in Cameroon. With colleagues from the University of Yaoundé, he worked on complex system modelling and artificial intelligence applied to applications like epidemiological surveillance and environmental monitoring in collaboration with IRD and CIRAD research institutes.

From 2018 to 2018, Serge was the Principal Investigator of GDRI Sense-South, an international research network of teams from Senegal, Cameroon, Vietnam and France working on "Innovative Sensors and IoT Telecommunication Networks for Environmental Surveillance in Southern Countries". Sense-south funds actions like the "Smart Clean Garden" project to control the water purification in soils and the sustainable city project of Douala (Cameroon) with a local climate change observatory.

He organised and co-organised more than 50 workshops and conferences on topics such as Software Engineering, Modelling and Simulation, Rescue Robotics, Disaster Management, and Complex Systems, and has supervised more than 20 PhD/Masters students from various countries (e.g., Chile, Vietnam, Cameroon, Senegal).

Research Interests

- Participatory and agent-based modelling
- Social simulation, complex system modelling
- Artificial intelligence applied to Sustainable Development Goals (SDGs)

Jaimee Stuart

Senior Researcher

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Education

Victoria University of Wellington
PhD in Psychology

Victoria University of Wellington
MSc in Cross-cultural Psychology

University of Canterbury
BA (Hons) in Psychology

Jaimee Stuart is a Cultural and Developmental Psychologist and Senior Researcher at the United Nations University Institute in Macau. Her research focuses on positive development for children, youth and their families. She is particularly interested in understanding developmental processes as they play out in contemporary contexts – those where there is extensive connection and engagement with technology, exposure to diversity, and experiences of global health and climate risks. Jaimee's work has a specific focus on empowerment for those who are minorities (cultural, religious, gender and sexual orientation) as well as those who experience inflated risk factors (e.g., exposure to violence, low socio-economic status, displacement).

Jaimee's past work has explored the relationships between social-ecological systems (e.g., family, peers, community, geography, and wider social systems) and health, wellbeing, and identity for youth. She has expertise in acculturation studies and participatory community research, having worked with Indigenous, migrant, and refugee communities in settler societies. Her research also extends to digital contexts, examining cyberaggression and victimisation, online disinhibition, social media use, self-presentation, and social connection for young people online.

Before joining UNU-Macau Jaimee worked as the Research and Evidence Lead at Pathways in Place, Griffith University, Australia where her work focused on co-creating solutions with the community to address place-based disadvantage. She has also worked as an academic at Griffith University and Victoria University of Wellington in their respective Schools of Psychology where she taught into developmental, cultural, and methods courses as well as supervised Doctoral, Masters, and Honours students. Prior to this Jaimee was a Senior Evaluator for the Ministry of Defence (NZ) focusing on equity and engagement, and a Research Fellow in the School of Population Health at the University of Auckland.

Research Interests

- Digital health and wellbeing
- Cyberpsychology and youth development
- Diversity, equity, and inclusion
- Resilience and empowerment for marginalised and/or vulnerable populations
- Media, communications, and technology for sustainable development

Min Yang

Research

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Education

Communication University of China

PhD in Communication Studies

Communication University of China

MA in Journalism and Communication

Xi'an University of Science and Technology

BA in Information Management and Information System

Min Yang is a researcher at the United Nations University Institute in Macau who is passionate about building a sustainable and peaceful future for all through knowledge generating and sharing.

Before joining the United Nations University Institute in Macau, she worked for the Social and Human Sciences Sector in UNESCO where she focused on advancing the 2030 Agenda and Sustainable Development Goals, with special contributions to the SDG 5, SDG 10, SDG 11 and SDG 16. Min undertook a series of programmes at global and regional levels for empowering young women and men, enhancing social inclusion centered on gender, as well as promoting peace education and peacebuilding. In addition, she also worked on specific areas of ethical reflection and capacity building, including AI ethics and climate change ethics. Min has experience of working in different media organizations as a journalist and editor. She was awarded the Global Governance Futures 2030 fellowship over the course of 2018 and 2019, and the German-China media ambassador in 2015. As a freelance writer for the Goethe-Institut China, she published articles on the humanities and environmental protection. Min holds a bachelor of information management and information system, a master of journalism and communication, and a PhD of communication studies.

Research Interests

- Gender and communication
- International organizations and international politics
- Media and Information Literacy
- Youth and sustainable development