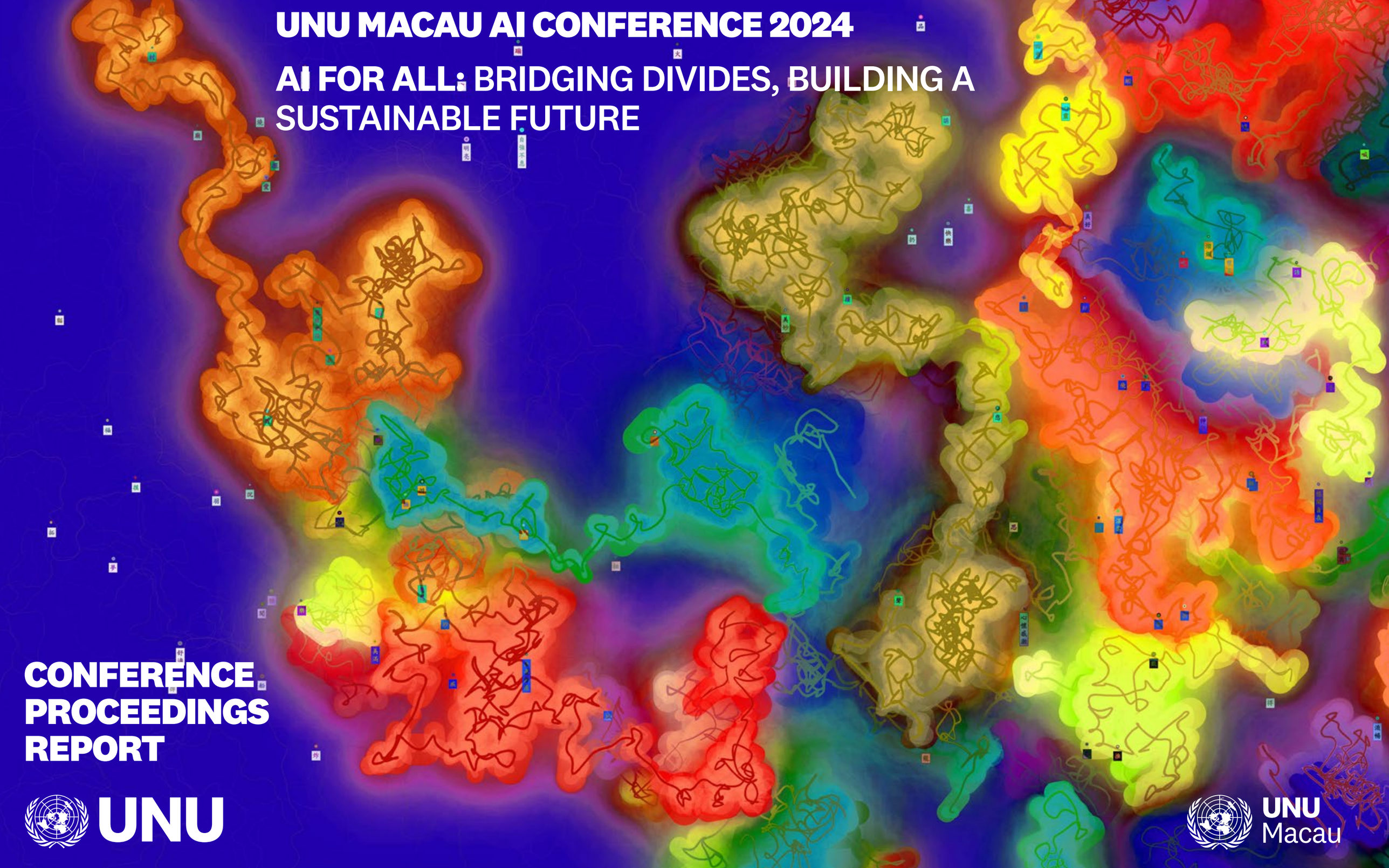
UNU MACAU AI CONFERENCE 2024

AI FOR ALL: BRIDGING DIVIDES, BUILDING A SUSTAINABLE FUTURE



CONFERENCE PROCEEDINGS REPORT

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REPORT
UNU Macau AI Conference 2024 – AI for All: Bridging Divides, Building a Sustainable Future. Conference Proceedings report.

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“...now is the time to think for the long term, to deliver more for young people and succeeding generations and to be better prepared for the challenges ahead...”

Our Common Agenda – Report of the UN Secretary-General
United Nations (2021)[1]

1 United Nations (2021). Our Common Agenda – Report of the Secretary – General. Accessed in June 2024 at: https://www.un-ilibrary.org/content/books/9789210010122 .

UNU MACAU BUILDING

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PREFACE

We are more than halfway through a historic process that is tragically far off track: achieving the targets of the Sustainable Development Goals by 2030. Today, over one-third of the targets have experienced no progress or, even worse, some have regressed below the 2015 baselines. Among the many challenges we face, the digital divide affects over 2.6 billion people who remain disconnected from the digital realm.

Achieving the goals by 2030 and ending our planetary emergency will not just take progress. Not even drastically accelerated progress will get us there. What we need now are breakthroughs. We need breakthroughs that will enable us to achieve full gender equity, navigate a just transition to clean energy, end poverty, and so much more.

For this reason, the United Nations University organized the *UNU AI conference, AI for All: Bridging Divides, Building a Sustainable Future.* At the conference, scholars, innovators, policymakers, and leaders from across the globe had a dialogue about how to advance AI to shape a sustainable future for all and how to make it responsible following the 2021 Recommendations on Ethics of AI produced by UNESCO[2].

The conference, which was focused on the Global South, was a contribution to the Summit of the Future that will be held in September 2024 in New York. At the summit, a Global Digital Compact will be adopted as an international commitment of stakeholders sharing principles to ensure that digital technologies are used responsibly and for the benefit of all in a safe and inclusive digital environment[3].

The United Nations University Global Artificial Intelligence Network (UNU Global AI Network) was officially launched at the conference. The network, a global platform that unites the expertise of academia, the innovation of the private sector, the foresight of policymakers, and the grassroots engagement of civil society units, materializes the Global Digital Compact.

2 UNESCO. Recommendation on the Ethics of Artificial Intelligence. UNESCO, 2021.
3 United Nations. Pact for the Future: zero draft. Accessed in June 2024 at: https://www.un.org/en/summit-of-the-future/pact-for-the-future-zero-draft .

“...AI has the potential to reshape our future for the better, but this can only be achieved through international cooperation...”

Tshilidzi Marwala – Rector of the United Nations University, Under-Secretary-General of the United Nations.

FOREWORD

The *UNU AI conference, AI for All: Bridging Divides, Building a Sustainable Future*, was a unique event that convened stakeholders from the Global North and the Global South, as well as the cultural East and West.

400 participants from governments (including 36 ICT officials from the Global South), business, academia, and civil society from 30 countries connected at the first ever conference of such scale on AI for the Sustainable Development Goals (SDGs) organized by a UN entity in Macau SAR, China.

Collective intelligence to co-create solutions on the use of AI to achieve the 2030 Agenda was nurtured at the conference with multiple dialogues that were organized around three tracks: AI to accelerate SDGs, AI and capacity building, and AI governance for the future. Partnerships to strengthen digital cooperation to help accelerate the SDGs were fostered, and a multi-stakeholder community on AI, inclusive of the Global south and the cultural East, was nurtured, resulting in the launch of the UNU Global AI Network, which embodies a collaborative initiative spearheaded by the UNU alongside its partners.

I would like to express my sincere gratitude to all those who contributed to the success of The UNU Macau AI Conference 2024. Special thanks to the organizing committee for their planning and dedication in making this year's conference a success.

The conference would not have been possible without the generous contributions from our sponsors, which include Chunlai Education, Huawei, Tencent, MGM, Venuture Cup China, Chun Lai Education Group, the Consulat Général de France Hong Kong, and the Federal Ministry for European and International Affairs of Austria. To them, I give a warm thank you.

"...the first AI conference hosted by UNU in Macau..."

Jingbo Huang – Director of UNU IIST Macau

THE UNITED NATIONS UNIVERSITY INSTITUTE IN MACAU

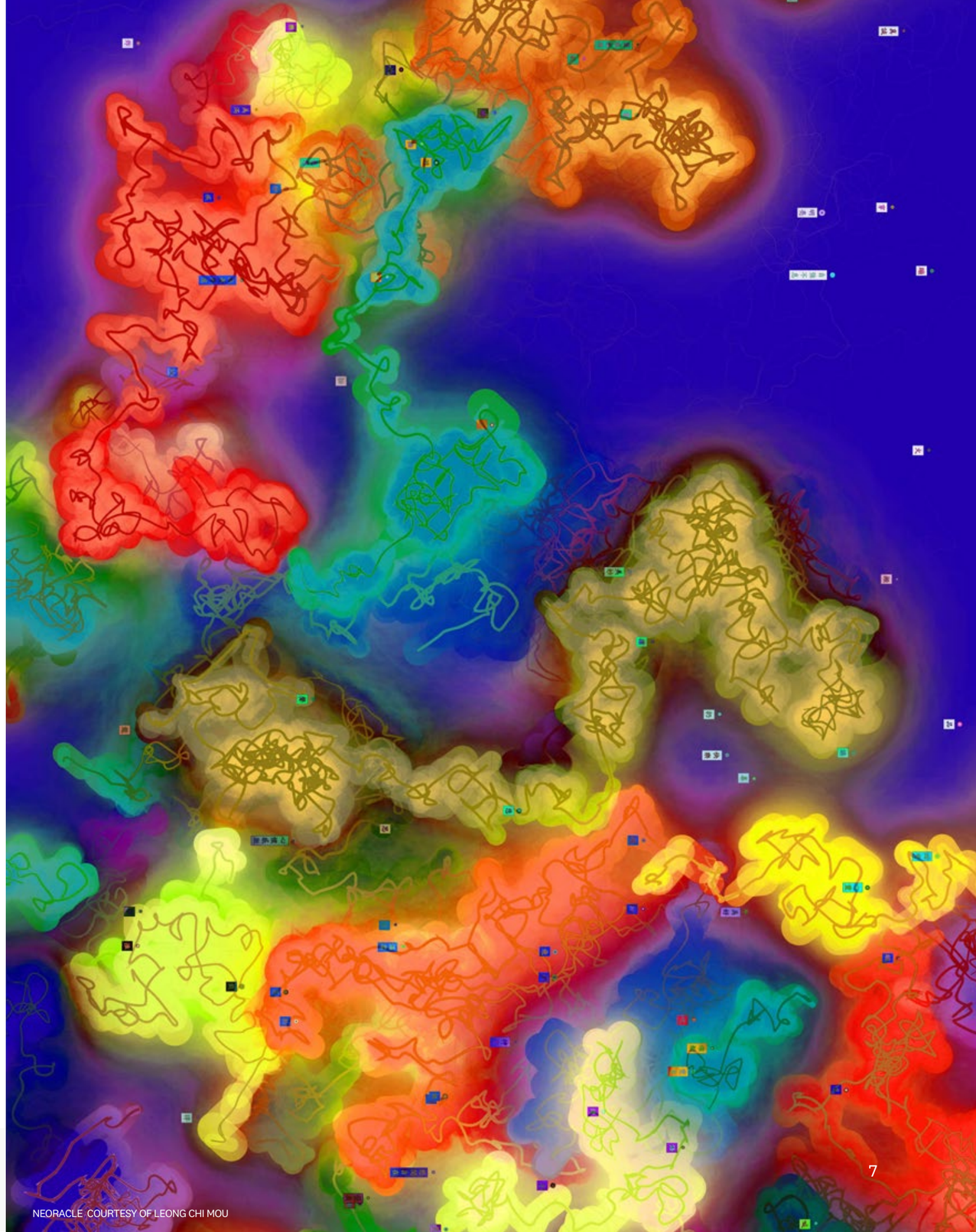
The United Nations University Institute in Macau (UNU Macau) is a United Nations (UN) global think tank conducting research, education and training at the intersection of digital technologies and sustainable development.

A member of the UN family and one of the 13 institutes of UNU, UNU Macau brings forward research evidence and training programs to help policymakers with the digital transformation. It also collaborates with industry partners to co-design research and learning programs for a sustainable digital future. It is strategically located in the Greater Bay Area of China, which enables it to bridge the west and east, south and north.

Through its multidisciplinary research team, the Institute examines the role of digital technologies in addressing global issues from a systems thinking perspective, supported by a participatory approach. This enables a holistic understanding of issues, in which diverse voices and experiences are included.

UNU Macau was founded in 1992 and has trained thousands of people from all over the world. The institute currently offers the following **training opportunities**:

+ **Digital technology for the 2030 Agenda**
  - Understanding the Sustainable Development Goals (SDGs)
  - Digitial technology and sustainable development
  - Understanding and engaging digital technology to build a sustainable future
  - Life online: mitigating risks and maximizing opportunities for health and wellbeing in the cyberspace
+ **AI for policymakers**
  - Demystifying AI
  - Responsible IA
  - AI Governance
+ **Data for sustainable development**
  - Data for sustainable development
  - Data privacy, protection and ethics
  - The use of synthetic data for training AI models – introduction to policy-makers
  - The global digital compact
+ **Computational tools for foresight**
  - Agent-based models for better health policies
  - Introduction to behavioral science and digital tech



NEORACLE. COURTESY OF LEONG CHI MOU

Voices from the Global South, the Global North, the cultural East, and the cultural West



























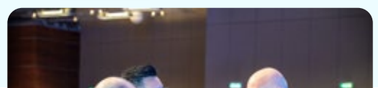












THE CONFERENCE

THE CONFERENCE

Under the theme *AI for All: Bridging Divides, Building a Sustainable Future*, UNU Macau connected problem-owners (e.g. policy makers) and solution providers (e.g. academia and technology industry), to tap into the transformative potential of leveraging AI technologies to advance sustainable development.

The **objectives** of the conference were to:

+ Create a **platform** for **knowledge sharing** on applied AI issues from multiple perspectives;

+ **Connect stakeholders** and support collaboration among diverse groups via common topics of interests related to AI;

+ **Co-create solutions** for and with AI that are data-driven, inclusive, and sustainable to help accelerate SDGs;

+ Support and **enable a multi-stakeholder community** on AI that is **inclusive of the Global South and the cultural East.**

The conference, that included keynote speeches, panel sessions, workshops for government officials and lightening talks was organized around the following **thematic pillars**:

+ **AI to Accelerate SDGs**
  This track explored how AI can be effectively utilised to accelerate the achievement of the Sustainable Development Goals (SDGs).

+ **AI and Capacity Building**
  This track focused on ways to harness the full potential of AI by building the capacity of individuals, organizations, and societies to understand, create, and use AI effectively and responsibly.

+ **AI Governance for the Future**
  This track examined the complex issues related to the ecosystem and governance of AI.

Macau SAR, China
April 24–25, 2024

120
speakers from **29** countries

398
participants

6
civil society organizations

36
senior government ICT officials from **16** countries of the Global South,

including Bangladesh, Bhutan, Cambodia, Egypt, Ethiopia, Fiji, Gambia, Lao PDR, Mexico, Mongolia, Morocco, Rwanda, Samoa, Sierra Leone, Tanzania, and Vanuatu.

28
academic institutions

32
United Nations units and other International Organizations

27
private sector companies

33
government institutions and initiatives

2
foundations

The conference was complemented by the following side events that were organized by the UNU and partners:

AIM Global: AI for Sustainable Development Goals in Industry and Manufacturing Organized by the UNU and the United Nations Industrial Development Organization (UNIDO).

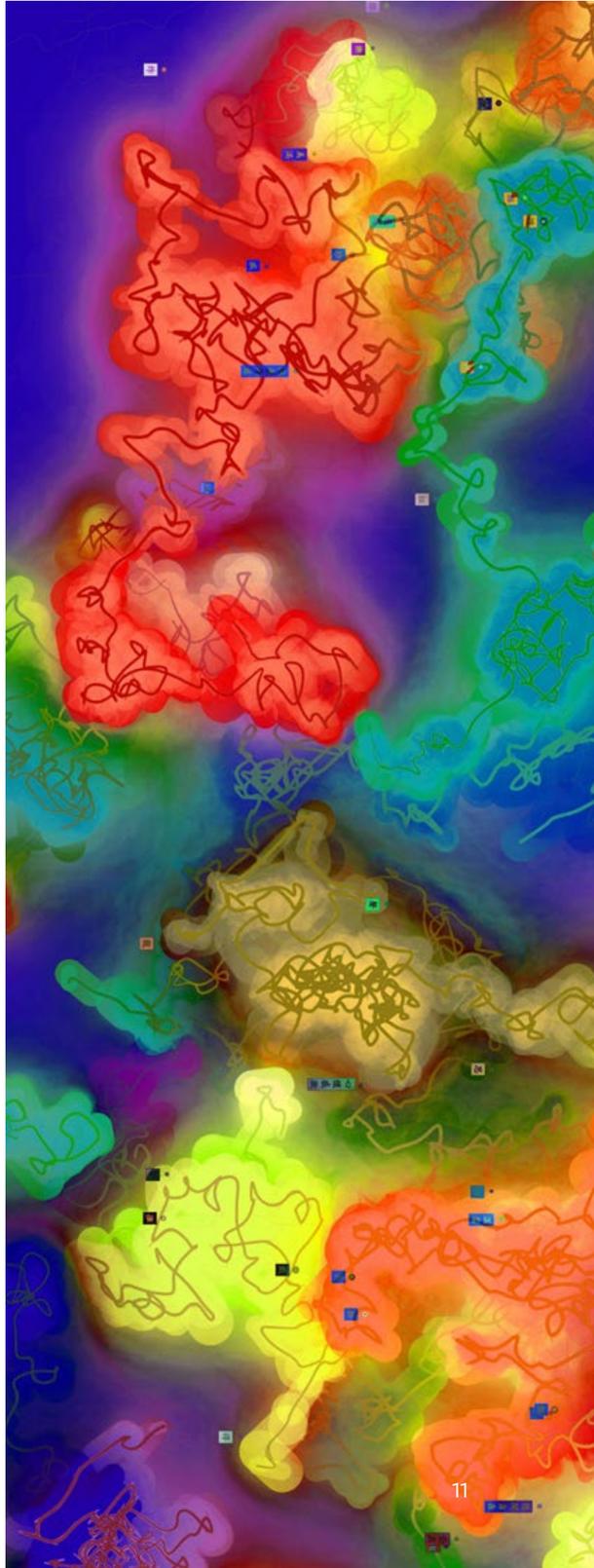
The Global Forum on Data Governance and Digital Transformation
Organized by the United Nations Department of Economic and Social Affairs (UN DESA).

Pre-Summit of the Future Dialogue on Artificial Intelligence and Digital Technology
The event was co-hosted by the United Nations Resident Coordinator's Office in China and UNU IIST Macau.

ICTP-UNU Workshop on TinyML for Sustainable Development
The event was co-hosted by the International Centre for Theoretical Physics (ICTP), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and UNU Macau.

WHAT WAS ACHIEVED?

+ A wide range of **stakeholders** from different sectors were **connected** to spur **collaboration** on AI for the SDGs at the **first ever conference** of such scale on **AI** for the **SDGs** organized by a UN entity in **Macau** SAR, China.
+ With experts from diverse sectors **sharing** their **knowledge** with the participants, the event was a knowledge fair on the use of AI to advance the 2030 Agenda that built the capacity of **400 participants**.
+ **Collective intelligence** to co-create solutions was **nurtured** through multiple dialogues on leveraging AI for **sustainable development**, with a special focus on opportunities, challenges, and risks related to governance frameworks and regulation.
+ A **multi-stakeholder community** on **AI**, **inclusive** of the **Global south** and the **cultural East**, was nurtured and **resulted** in the **launch** of the **UNU Global AI Network**, which embodies a collaborative initiative spearheaded by the UNU alongside its partners.
+ **Partnerships** to strengthen **digital cooperation** to help accelerate the SDGs were fostered as the **alliance** built between **UNIDO** and UNU was formalized with a collaboration pledge signed between the UNIDO Global Alliance on AI for Industry and Manufacturing and the UNU Global AI Network.
+ The conference demonstrated the value of **applying foresight to scientific research to inform policy**, as highlighted in the Recommendations on the Use of Synthetic Data to Train AI Models produced by the United Nations University.
+ As recommended in the Global Digital Compact: Zero Draft[4], **public** and **private investment** was **channeled** to invest in AI for the SDGs, with seed funding committed for the first project of the UNU Global AI Network.



4 UUnited Nations. Global Digital Compact: zero draft.
Accessed in June 2024 at: https://www.un.org/techenvoy/sites/www.un.org.techenvoy/files/Global_Digital_Compact_Zero_Draft.pdf.

CONFERENCE PROCEEDINGS

AI TO ACCELERATE SDGS

HOW TO USE SYNTHETIC DATA TO TRAIN AI MODELS

Chair
Eleonore Fournier-Tombs (Head of Anticipatory Action and Innovation, UNU CPR)

Panelists
Tshilidzi Marwala
(Rector, United Nations University and Under-Secretary-General, United Nations),
Philippe de Wilde (Professor of Artificial Intelligence, University of Kent)
Fernando Buarque (Senior Associate Professor of Computing(AI), School of Engineering, University of Pernambuco, Brazil)
Mamello Thinyane (Optus Chair of Cybersecurity and Data Science, Associate Professor, University of South Australia)
Serge Stinckwich (Head of Research, UNU Macau)
Yik Chan Chin (Associate Professor, School of Journalism and Communication, Beijing Normal University)

• *Session Overview*

The use of synthetic data to train AI models, especially in the Global South, was discussed in the session. Presenters explained that synthetic data is data generated artificially with algorithms to simulate real-world data and it is used to train and test AI models in contexts where there is a lack of real data and also to protect the privacy of the individuals behind the real world's data. This type of data is increasingly used, specially in the Global South for a wide range of applications, from health systems to cybersecurity[5]. Presenters explained that the use of synthetic data is on the rise, accelerated by the use of GenAI models, and it is estimated that in 2024, 60 per cent[6] of the data used to produce AI models will be synthetic. There are limited policy guidelines to address the challenges and opportunities associated to the use of synthetic data to train AI models at the global, regional, or national levels. One of the first instruments is the *UNU Policy Guideline: Recommendations on the Use of Synthetic Data to Train AI Models*, produced by researchers at the UNU, that was introduced at the session. The guideline explains that, while synthetic data can overcome data scarcity and privacy considerations, its use has associated risks, including the propagation of biases and stereotypes, as well as risks associated with cybersecurity[7].

INCORPORATING UN VALUES AND PRINCIPLES INTO VIDEO GAMES DESIGN POWERED BY AI

Chair
Auxane Boch (Chair, Associate Researcher, Institute for Ethics in Artificial Intelligence (IEAI), Technical University of Munich)

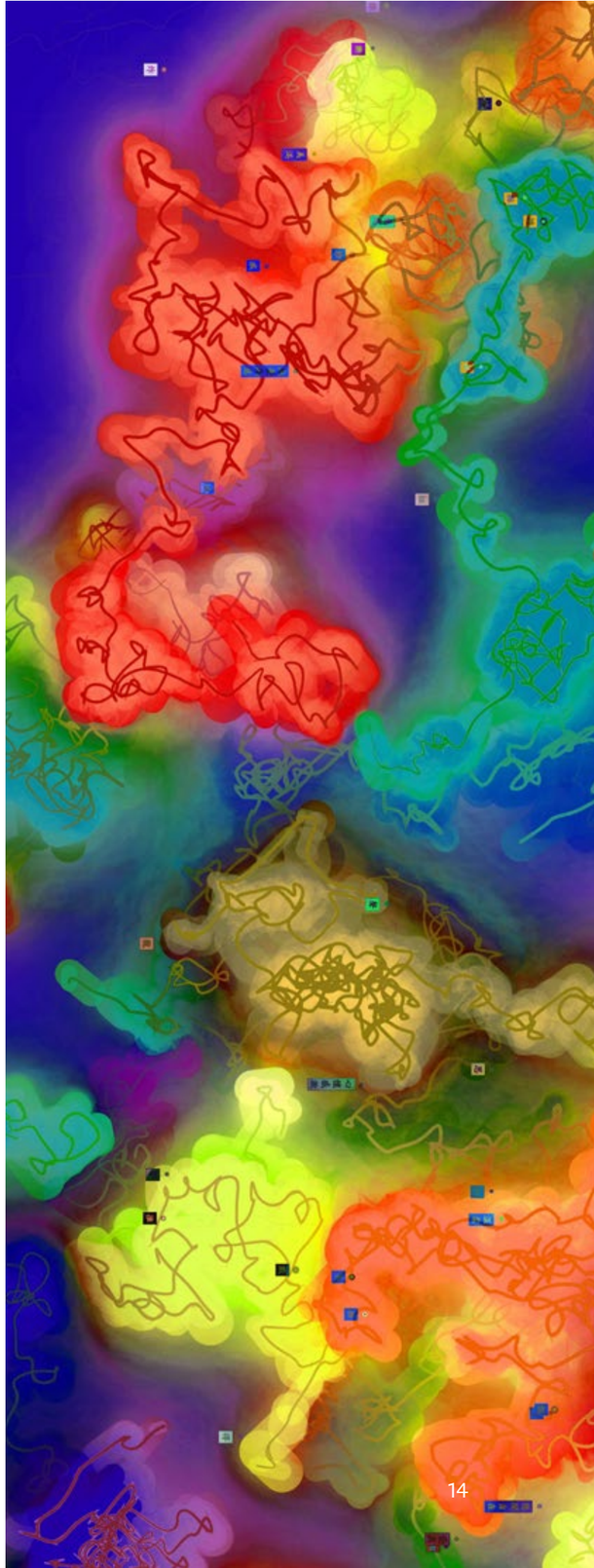
Speakers
Tshilidzi Marwala (Rector, United Nations University and Under-Secretary-General, United Nations)
Gary Liu (Managing Director Red Pavillion Limited)
Ada Han (Head of the Sustainable Development Strategy Hub Boke Technology Group Co., Ltd)
Qingxu Zhu (Robotics researcher at Tencent Robotics X Lab working on reinforcement learning for control of robotics and physics-based characters)
Olivier Madiba (CEO of Kiro'o)

• *Session Overview*

This session seeks to harmonize the entertainment value of games with educational and ethical dimensions, fostering global citizenship, sustainability, and diversity through digital storytelling and gameplay. Acknowledging the scrutiny faced by the video game industry, this discussion will pivot towards its potential for positive impact, highlighting initiatives that align gameplay with real-world problem-solving and environmental stewardship.

• *From the speakers*

Auxane Boch
Social robots are a new type of robot that has the potential to disrupt human-to-human relations. This paper aims to contribute to the ongoing integration of psychology into social robotics ethics by reviewing current theories and empirical findings related to human-robot interaction and addressing critical points of contention within



5 Philippe de Wilde, Payal Arora, Fernando Buarque, Yik Chan Chin, Mamello Thinyane, Stinckwich Serge, Fournier-Tombs Eleonore and Marwala Tshilidzi. Recommendations on the Use of Synthetic Data to Train AI Models. UNU Centre, UNU-CPR, UNU Macau, 2024.
6 77 Accessed on June 2024 at: https://www.gartner.com/en/newsroom/press-releases/2023-08-01-gartner-identifies-to -trends-shaping-future-of-data-science-and-machine-learning.
7 Philippe de Wilde, Payal Arora, Fernando Buarque, Yik Chan Chin, Mamello Thinyane, Stinckwich Serge, Fournier-Tombs Eleonore and Marwala Tshilidzi. Recommendations on the Use of Synthetic Data to Train AI Models. UNU Centre, UNU-CPR, UNU Macau, 2024.

the ethics discourse. We will explore the factors influencing the acceptance of social robots and investigate the development of relationships between humans and robots, and delve into three prominent controversies: deception, dehumanization, and violence. In conclusion, we will offer explicit recommendations for future research endeavors and the ethical design of human-Robot interactions.

AI FOR SDG DEVELOPMENT

Chair
Farzad Sabetzadeh (Assistant Professor, City University of Macau)

Speakers
Shuan Sadreghazi (Researcher, Institute for Future Initiatives, The University of Tokyo),
Upalat Korwatanasakul (Associate Professor, Faculty of Social Sciences, Waseda University)
Ally Nyamawe (Researcher, UNU Macau)

• *Session Overview*

The session covered diverse applications and implications of AI across various sectors. The first presentation focused on Green AI's role in combating climate change by developing energy-efficient algorithms and hardware, combating deforestation, and fostering a circular economy. It highlighted policy recommendations for integrating AI into agriculture to enhance sustainability through precision farming and autonomous systems. The discussion also underscored the need for comprehensive regulations to address the legal and ethical concerns associated with generative AI, promoting transparency and accountability. The second presentation examined AI's transformative potential in agriculture, particularly for smallholder farmers in the Global South. It explored AI-based technologies like precision herbicide application, pest and disease identification, and deforestation detection, which can enhance sustainable agricultural practices. The presentation emphasized the importance of governance mechanisms to ensure smallholder farmers effectively leverage AI for sustainability, drawing insights from research in the palm oil and coffee sectors of Southeast Asia. The third presentation discussed the uneven progress of developing countries towards the Sustainable Development Goals (SDGs) and how AI can accelerate this progress. It reviewed AI's positive impact on various SDG targets and highlighted challenges faced by developing countries in AI adoption, such as underinvestment and lack of preparedness. The session recommended formulating national AI strategies, prioritizing AI adoption in key sectors, and investing in education and capacity-building programs to enhance AI utilization. The final presentation focused on AI's integration into education, highlighting its potential to personalize learning and streamline educational processes. It addressed the opportunities and risks associated with AI in education, such as the potential for plagiarism and the reduction of critical thinking skills. The discussion emphasized the need for ethical guidelines and regulatory frameworks to ensure the responsible use of AI, fostering innovation while safeguarding against potential harms.

• *From the speakers*

Farzad Sabetzadeh
Green AI is more than a buzzword, it is a powerful tool for combating climate change. It will demonstrate how artificial intelligence can be developed and used sustainably, minimizing its own impact, maximizing energy efficiency, combating deforestation, and fostering a circular economy. We will explore concrete examples of renewable energy and waste management, taking into account issues such as data privacy and algorithmic bias. Our goal is to chart a path to responsible Green AI development to ensure equitable access and maximize its potential for a truly sustainable future.
1. Green AI: Green AI emphasizes the need for AI systems to be environmentally conscious, not just in their applications but in their operations. Considering energy consumption in AI development is crucial for ensuring the long-term sustainability of AI systems. By developing energy-efficient algorithms and hardware, we can minimize the environmental impact of AI technologies, reduce carbon emissions, and contribute to a greener and more sustainable future. To reduce the carbon footprint of AI, policies should encourage:
+ Utilization of existing AI models and fine-tuning rather than creating new ones from scratch.
+ Adoption of energy-efficient computational methods and evaluation of energy sources for data centres.
+ Inclusion of AI activities in carbon footprint monitoring to promote transparency and accountability.

2. AI for Sustainable Agriculture: AI has the potential to revolutionize agriculture, making it more sustainable and efficient. Some specific applications of AI in sustainable agriculture include precision farming, where AI is used to analyse soil conditions and optimize the use of fertilizers and pesticides, as well as autonomous farming, where AI-powered robots and drones can perform tasks such as planting, monitoring crop health, and harvesting. AI can also assist in predicting and managing pest outbreaks, optimizing irrigation systems, and improving crop yield through data-driven decision-making. Policy recommendations include:
+ Supporting smallholder farmers by integrating AI tools that are accessible and tailored to their needs.
+ Encouraging collaborative approaches among stakeholders to ensure that AI solutions are equitable and beneficial for all parties involved.
+ Investing in data-driven insights for optimized resource usage, crop yields, and environmental protection.

3. Legal and Ethical Issues of Generative AI: Generative AI raises complex legal and ethical questions. To address the legal and ethical issues raised by generative AI, it is important to establish comprehensive regulations and guidelines. This can include implementing strict data protection laws to ensure the privacy and consent of individuals whose data is used by AI systems. Additionally, transparency and accountability measures should be put in place to trace the origin of AI-generated content and hold responsible parties accountable for any harm caused. Lastly, fostering interdisciplinary collaborations between AI researchers, policymakers, and ethicists can help navigate the ethical complexities and ensure that the development and deployment of generative AI align with societal values and interests. Policies should address:
+ The protection of intellectual property and data privacy in the development and use of generative

AI models.
+ The establishment of regulatory frameworks that balance innovation with ethical considerations and societal norms.
+ The promotion of transparency and accountability in AI systems to mitigate biases and ensure fair use.

The integration of AI into sustainable development practices offers immense opportunities but also presents significant challenges. A forward-thinking, collaborative approach is essential to harness the full potential of AI for achieving the SDGs.

Shuan Sadreghazi

Agriculture stands as a vital livelihood source in the Global South, predominantly driven by smallholder farmers. These farmers face challenges such as low productivity, soil degradation, and excessive chemical use, compounded by climate change impacts like extended dry seasons and increased plant diseases. In this context, AI-based technologies emerge as potential game-changers, promising to enhance sustainable agricultural practices. Examples include AI-trained cameras for precision herbicide application, pest and disease identification algorithms, tools for carbon level estimation in soils, and rapid detection systems for illegal deforestation. Such advancements not only promise reduced chemical usage but also support regenerative agricultural methods and environmental protection. However, the adoption and impact of these AI technologies on smallholder farmers raises critical questions, particularly regarding governance. What governance mechanisms can ensure smallholders' effective inclusion in leveraging AI for sustainable agriculture? Drawing from extensive research in the palm oil and coffee sectors of Southeast Asia, this presentation explores practical and theoretical aspects of using AI to aid smallholder farmers in transitioning towards sustainability. We scrutinize the role of trading companies in orchestrating sustainability across agricultural value chains and propose governance strategies to foster a more inclusive and effective use of AI in agriculture. Our findings offer insights into balancing technological advancement with equitable and sustainable growth for smallholders, crucial for the future of agriculture in the Global South.

Upalat Korwatanasakul

Developing countries have experienced steady economic growth, but their overall progress towards achieving the Sustainable Development Goals (SDGs) raises concerns. Notably, advancements in sustainable industry and innovation (Goal 9) have occurred. Still, progress in other areas, especially those related to environmental development such as responsible consumption and production (Goal 12), climate action (Goal 13), life below water (Goal 14), and life on land (Goal 15), has been slow (UNESCAP 2021). Introducing artificial intelligence (AI) technology is a potential catalyst to accelerate progress toward SDGs in developing countries. Several studies, including those by Galaz et al. (2021), Korwatanasakul and Takemoto (2021, 2022), Nishant, Kennedy, and Corbett (2020), and Sætra (2021), have highlighted the positive impact of AI applications in achieving SDGs globally. AI positively affects 79% of the 169 SDG targets, including 93% of environmental targets, 70% of economic targets, and 82% of social targets (Vinuesa et al. 2020). Developed economies worldwide have successfully leveraged AI to fulfil the SDGs, and developing countries are poised to follow suit. Projections suggest that AI could significantly contribute to the economies of developing countries. AI-enabled initiatives have demonstrated potential benefits in various developing countries. Examples include initiatives for improved urban planning, crime prevention, and health-related projects. Moreover, collaboration with international partners has created tools for monitoring and managing environmental challenges, such as plastic waste and ocean pollution. Despite the potential benefits, developing countries face challenges in adopting AI technologies. These challenges include a lack of AI preparedness and resilience compared to more developed economies. AI preparedness involves the ability to seize opportunities arising from AI, while AI resilience involves adapting to structural changes due to AI and technological disruption. Indicators such as investment in AI technologies, innovation capacity, digital literacy, human capital, and data infrastructure can gauge AI preparedness. Meanwhile, government vision, governance, ethics, digital capacity, and adaptability are proxies for AI resilience. According to our preliminary analysis based on the data of Oxford Insights (2021), Salesforce (2021), IIC and TRPC (2020), and OECD.AI (2021), the findings underscore that inadequate levels of AI resilience and preparedness hinder developing countries' utilization of AI technologies to achieve SDGs. Challenges include underinvestment in AI by the business sector, impaired vision and digital capacity in the government sector, and slow adjustment to AI technologies by both government and business sectors. To respond to these challenges, governments should formulate national AI strategies for accelerating the development of fundamental AI policy frameworks while prioritizing the adoption of AI in key sectors, and these efforts must strike a balance between ecosystem developments and regulatory approaches. Governments can also boost private sector investment in AI through incentive programs, such as financial support and safe and secure cyberspace creation. Finally, these measures can be complemented by promoting education and capacity-building programmes introducing AI-related knowledge to accelerate the adoption of AI technology among the public and private sectors.

Ally Nyamawe

Integrating Artificial Intelligence (AI) in education is a transformative development that promises to revolutionize the teaching and learning landscape. AI-powered tools can personalize learning experiences, adapting to individual student needs and fostering more effective learning outcomes. For example, intelligent tutoring systems, predictive analytics, and administrative automation can streamline educational processes. Consequently, this will reduce the burden on educators and enhance student engagement and performance. Generative AI tools, for instance, can aid in content creation, provide instant feedback, and support creative learning environments. However, alongside these unique opportunities, such tools also come with significant educational risks and challenges. Notable risks include the potential for plagiarism, the spread of misinformation, and the reduction of critical thinking skills if students over-rely on Generative AI tools. To address these issues, various organizations and regulatory bodies have put forth recommendations for the ethical use of AI in education. These include data protection principles, transparency and accountability guidelines, and frameworks for

responsible deployment of AI technologies. This talk will highlight insights into AI regulation in education - offering a balanced perspective on ensuring the responsible use of AI in the sector. It will underscore the importance of thoughtful regulation and ethical considerations to ensure that AI is a beneficial tool in education - fostering innovation while safeguarding against potential harms.

AI AND CLIMATE CHANGE

Chair
Dong Liu (Research Assistant Professor, The Chinese University of Hong Kong)

Speakers
David Daou (Research Manager Climate Risk Modelling, UNU-EHS)
Pia Faustino (Director for Social Impact and Sustainability, Thinking Machines)
Lei Huang (Associate Professor, Institute of Remote Sensing and Digital Earth, Chinese Academy of Science)

• *Session Overview*

The session highlighted that the urgent need to address climate change has led to a global shift toward clean energy solutions, especially in transportation, to reduce greenhouse gas emissions. It was shown that clean vehicles (CVs) offer significantly lower carbon footprints compared to traditional petrol-powered vehicles. Using a data-driven approach that combines GPS data with support vector machine (SVM) analysis, CV refueling patterns can be discerned, providing policymakers with insights for strategic refueling infrastructure planning. Moreover, the session showcased UNU-EHS's in-house developed Climate Change related algorithms and algorithms developed to scrape internet search engines to understand overlooked disasters and social sciences, as well as for teaching and analyzing surveys with complex parameters. Challenges in computing time for high-resolution satellite image analysis were discussed, highlighting the importance of AI in enhancing climate change models and early warning systems. Moreover, various applications of GeoAI to aid and expand impactful work were explored. The use of data and AI solutions to accelerate the SDGs were also showcased. In particular, geospatial data, like satellite imagery, coupled with computer vision were shown to be promising tools to locate and map areas like mangrove restoration sites and climate-vulnerable communities. The final presentation evaluated China's progress towards environmental SDGs using big Earth data from 2010 to 2022. The study revealed that China had achieved half of its environmental indicators by the midpoint of the 2030 Agenda, with spatial information providing insights into progress and imbalances. Overall, the session underscored the transformative potential of AI and data-driven solutions in achieving sustainable development and combating climate change.

• *From the speakers*

Dong Liu
The urgent need to address climate change has prompted a global shift towards embracing clean energy solutions, particularly in the transportation sector, to mitigate greenhouse gas emissions. Clean vehicles (CVs), also known as alternative fuel vehicles (AFVs), offer significantly lower carbon footprints compared to traditional petrol-powered vehicles. To support the growing demand for CVs, it becomes crucial to gain a comprehensive understanding of CVs' refueling patterns and optimize the distribution of refueling stations accordingly. In this research, we propose an innovative data-driven approach that combines GPS data with the machine learning technique known as support vector machine (SVM). By leveraging this approach, we can accurately identify and analyze the behaviors and trends associated with CV refueling. The integration of GPS data allows us to capture the spatial and temporal aspects of CV movement and refueling patterns, providing valuable insights for strategic planning. By accurately identifying these behaviors and trends, policymakers and planners can make informed decisions regarding the optimal placement and distribution of refueling stations. The developed data-driven machine learning method is applicable to urban environments worldwide, catering to the diverse needs and contexts of different cities. The insights gained from the analysis can help policymakers and planners strategically plan and optimize future CV refueling infrastructure to ensure efficient and accessible refueling options for CV owners. This approach not only contributes to sustainable transportation planning but also facilitates the seamless integration of CVs into existing urban landscapes. By adopting an evidence-based approach to CV refueling infrastructure planning, we can promote the widespread adoption of CVs and further reduce greenhouse gas emissions in the transportation sector. This research aims to bridge the gap between clean energy solutions and urban planning, enabling policymakers to make informed decisions and creating a more sustainable and environmentally friendly transportation system.

David Daou
Synergy of AI and remote sensing to improve land observations and use of reinforcement learning to uncover overlooked disasters. This presentation will take you along the journey of UNU-EHS in-house AI developed algorithms. It will cover two main categories of algorithms: Climate Change related algorithms developed on drought, land observation, and aerosols atmospheric physics properties using LIDARs, and algorithms developed to scrape internet search engines to understand overlooked disasters and social sciences, as well as for teaching and analyzing surveys with complex parameters. These in-house algorithms range from using standard machine learning methods to more shallow and deep learning tools, based on the needs of our projects and stakeholders. An interesting example are our results related to finding small local natural hazard events that can't be found when using internet search engines or databases. Our algorithm uncovered these events reported in local newspapers in Nepal and Mexico. This improved our understanding of the events themselves, and showed the potential that AI can have on climate change and enhancing developed models. We will enumerate the challenges we faced and are still facing, especially in terms of computing time when it comes to deep learning algorithms applied to high resolution satellite images. The latter are of utmost importance when it comes to distinguishing areas of flood and/or drought, in order to better classify images and help people suffering from natural hazards and disasters. This presentation will shed light on how AI can improve the environment and our understanding of Climate Change while combining

AI synergies with satellite remote sensing instruments, for identifying droughts and triggering early warning systems.

Pia Faustino
Explore various applications of GeoAI to aid and expand impactful work, all while optimizing resources like time, costs, and labor. Discover why AI-augmented tools are our key to building a livable world and a sustainable future. Solving big problems like combating climate change and scaling conservation efforts entail twin challenges: they're urgent, but also require a wealth of resources. Organizations like Conservation International and UNICEF have worked with us to employ geospatial data, analytics, and AI to scale the impact of their missions. In this talk, we'll share the work we've done to accelerate progress toward the SDGs using data and AI solutions. In particular, geospatial data, like satellite imagery, coupled with computer vision are promising tools to locate and map areas like mangrove restoration sites and climate-vulnerable communities. We've also trained machine learning models on open-source data to estimate haze levels and support improved air quality monitoring. In all these cases, we've demonstrated that data and AI can help organizations accelerate progress towards the UN Sustainable Development Goals. Several of our development projects are conducted in partnership with UNICEF Venture Fund through our Artificial Intelligence For Development (AI4D) Research Bank, where we share all of our code, documentation, and pre-processed data sets to support and scale AI-powered and data-driven development efforts.

Lei Huang
The environment changed drastically in China with rapid economic development in the past decades, but the lack of data, especially data with spatiotemporal information, was a hindrance to evaluating the progress of environment towards Sustainable Development Goals (SDGs). Here, we evaluated and explored the geospatial information and evaluated the progress of all of the 92 environmental indicators in China from 2010 to 2022 using big Earth data. We find that at the mid-point of the 2030 Agenda, China has already achieved half of the environmental SDG indicators. The progress and imbalance are also evaluated using spatial information.

AI IN HEALTHCARE

Chair
Samuel Chan (Former President, Science and Technology Development Fund (FDCT), Macau SAR)

Speakers
Fhumulani Mavis Mulaudzi (Professor, The University of Pretoria in South Africa)
Rodwell Gundo (Postdoctoral Research Fellow, The University of Pretoria in South Africa)
Shaun Martin (Senior Project Manager for WWF Asia-Pacific Counter-Illegal Wildlife Trade Hub)
Claudia Abreu Lopes (Research Fellow, UNU-IIGH)
Niharika Rustagi (Postdoctoral Fellow, UNU-IIGH)
Lei Chaoyu (M.D. candidate, Department of Ophthalmology, Shanghai Ninth People's Hospital Shanghai Jiao Tong University, School of Medicine)
Wang Bin (Nursing graduate student from Hangzhou Normal University)

• *Session Overview*

The session highlighted the opportunities and challenges of AI in transforming global healthcare. For instance, nursing practitioners and educators have embraced technology to enhance patient care. However, they face several issues, including inclusivity. It is crucial to involve nurses in designing and implementing digital tools to ensure accessible healthcare services. Ethical concerns arise as core nursing principles like compassion and caring are challenged by AI. The African philosophy of Ubuntu, emphasizing care and interconnectedness, provides valuable insights for promoting digital inclusion and ethical AI integration in nursing. Moreover, ML tools were shown to have capabilities to prevent large-scale outbreaks of Zoonotic diseases and enhance scientific research and healthcare. Zoonotic diseases, transmitted between animals and humans, have existed for over 10,000 years, with examples like SARS, MERS, Ebola, and COVID-19. The tools can predict disease emergence locations based on factors like deforestation, illegal wildlife trade, and demographic changes. Furthermore, the session highlighted that, digital technologies, including AI, significantly impact women's and girls' sexual and reproductive health and rights (SRHR). These technologies improve access to contraception, abortion, STI prevention, counselling, and menstrual health information. However, they can also exacerbate healthcare inequalities due to digital gaps related to gender, literacy, income, rural-urban divide, migrant status, and disability. Strong digital health governance is essential to balance opportunities and risks. Lastly, it was showcased that facial characteristics linked to medical conditions can aid in disease detection. The presented research explores integrating AI in facial recognition with Traditional Chinese Medicine (TCM) practices for early diagnosis and healthcare improvement. Despite challenges like privacy and bias, the approach promises non-invasive, cost-effective, and equitable health technologies, aligning with global health equity goals.

• *From the speakers*

Fhumulani Mavis Mulaudzi and Rodwell Gundo
The rapid integration of digital technology including Artificial Intelligence (AI) into professions and personal lives has influenced the role of nursing, which is to provide compassionate and humanistic care to patients. During the period of the COVID-19 pandemic, nurse practitioners and nurse educators were forced to rely on digital technology, but many faced challenges due to lack of resources and skills. Healthcare professionals have now embraced the opportunities presented by the digital age, using technology to enhance their practices and elevate the quality of patient care. It is essential to ensure that accessible services are readily available to prepare for potential future global outbreaks. To adapt to global changes, nurses need to embrace digital transformation including AI and be involved in the design and implementation of digital technology. Unfortunately, nurses' voices are often unheard in this process. In addition, innovations in digital technology have posed ethical challenges in many fields including nursing practice. Some scholars argue that ethical principles such as compassion and caring which are the core of nursing and healthcare practice cannot be replaced by robots and AI. The principles of the Ubuntu community

model in nursing can offer valuable insights, reflecting the African continent's ethos and social wisdom, to promote digital inclusion and the use of AI. Ubuntu is an African philosophy that emphasizes the importance of care, concern, and interconnectedness between people. The African voice through the lens of Ubuntu philosophy is critical in the integration of digital technology and AI in healthcare including nursing.

Shaun Martin

Zoonotic diseases are those which can pass from one animal species to another, and also between human and animal hosts. They are not a new phenomenon; archaeological evidence suggests that they have been present in humans for over 10,000 years. Examples of zoonotic diseases include SARS, MERS, Ebola, and COVID-19. While systems are in place for monitoring and surveillance, historically there has been difficulty in prediction of new diseases. The goal of this project is to create a machine-learning (ML) system that predicts potential locations of disease emergence based on known factors such as deforestation, the illegal wildlife trade and demographic change, allowing pre-emptive disease control measures to be put in place prior to large-scale outbreaks. The current model ingests multiple data formats from various domains such as regional infrastructure, population density, deforestation, biodiversity and animal disease. The pilot project is being developed with an initial focus on the Mekong Basin region and we are developing it on a digital platform which may in future be scaled to include other parts of the world. The ML algorithms are tailored to extract features within a defined radius around geographical coordinates, utilizing spatial analytics to assess proximity to relevant biotic and abiotic factors. The algorithm then seeks to identify the importance of geographic, demographic, environmental or other factors in predicting disease hotspots. Planned enhancement includes greater automation in data ingestion, ongoing training of the machine learning algorithm for more accurate predictions and developing a user interface for expert assessment of risk. The model's predictive capabilities will extend to various applications, from scientific research to the provision of healthcare, offering an innovative tool for preemptively addressing zoonotic disease risks. Though this initiative is still in its infancy, we wish to share our work, lessons learned and intentions for future development

Claudia Abreu Lopes

Digital technologies, including artificial intelligence (AI) are rapidly 'redefining and reshaping' health systems. One area on which digital technologies are having a significant impact is on the lives of women and girls, particularly in relation to sexual and reproductive health and rights (SRHR). With the help of technology and digital tools, access to reliable information and services related to contraception, abortion, sexual transmitted diseases (STI) prevention and counseling, and menstrual health can be significantly improved. While this can be game-changing and transform how SRHR services and information are delivered, there are challenges too. Digitization can exacerbate inequalities in healthcare access and health outcomes due to gender, literacy, and income-related digital gaps, as well as the rural-urban divide, migrant status, and disability. As the UN Special Rapporteur on right to health, pointed out, 'digital technologies can perpetuate racism, sexism, ableism or discrimination based on sexual orientation or gender identity, among others. Therefore, given the rampant inequalities in health, the digital gaps in the access and use of technologies and the pervasive threats to digital privacy and security, the opportunities that digital technologies present need to be balanced with potential challenges and risks, making strong digital health governance frameworks imperative.

Lei Chaoyu

Medical conditions and systemic diseases often manifest distinct facial characteristics, and the identification of these unique facial attributes has the potential to facilitate disease detection and early diagnosis. This is particularly relevant in the context of the Sustainable Development Goals (SDGs), where early detection and prevention of diseases play a crucial role in improving public health and advancing global health equity. However, disease detection by facial photography remains challenging due to the wide variability in human facial features and disease conditions. In the realm of Traditional Chinese Medicine (TCM), facial diagnosis is a well-established practice, where different areas of the face correspond to different internal organs. The integration of artificial intelligence (AI) in facial recognition could potentially modernize this ancient practice, providing a method that can be user-friendly, non-invasive, and cost-effective. This aligns with the SDGs' emphasis on innovation and infrastructure for sustainable development, as well as the global health agenda of developing affordable and equitable access to health technologies. This research examines the potential of facial recognition to discern subtle facial phenotypes that are characteristic of eight major categories of health disorders, including those traditionally recognized in TCM. We first outline the technology pipeline which constitutes the basis for effective implementation in healthcare settings. We then explore the applications of facial recognition in healthcare, from disease screening to diagnostics, and discuss its extension to health monitoring, treatment decision-making, and disease follow-up, thereby encompassing the entire cycle of disease management. Furthermore, we identify and propose solutions to significant technical and ethical challenges, including privacy concerns, interpretability, data scarcity, dataset complexity, and potential biases in AI models. Addressing these issues is crucial for leveraging facial recognition to its fullest potential, thereby empowering healthcare providers and enhancing patient care outcomes, and bridging the gap between modern medicine and TCM. In doing so, we contribute to the SDGs and the broader global health objectives of reducing health disparities and improving health outcomes for all.

AI AND IOT

Chair

Philippe de Wilde (Professor of Artificial Intelligence, University of Kent)

Speakers

Zihan Kan (Assistant Professor at the Department of Geography and Resource Management, The Chinese University of Hong Kong)
Marco Zennaro (Researcher at the Abdus Salam International Centre for Theoretical Physics (ICTP))
Thomas Basikolo (Programme Officer in the Telecommunication Standardization Policy Department of the ITU Telecommunication Standardization Bureau (TSB))

• *Session Overview*

This session explored the connections between environmental health and technology. The session highlighted that individuals are often exposed to multiple environmental factors simultaneously, and understanding their joint effects is essential for developing effective public health policies. The session featured a discussion on the study that examined the relationships between and geographic patterns of individual exposures to air pollution (PM2.5), noise and greenspace using individual-level real-time GPS and mobile sensing data collected in an outdoor environment. The findings of such study suggest that the relationship between individual exposures to air pollution, noise and greenspace varies across different value ranges of environmental exposures. The study also reveals that exposures to multiple environmental factors exhibit spatial heterogeneity and strong clustering patterns. These results highlight the importance of considering spatial heterogeneity and proximity of environmental exposures in understanding the relationships between multiple exposures in environmental health research. Moreover, it was highlighted that AI can help achieve the UN's SDGs, but it faces challenges such as high-power use, connectivity needs, and cloud costs. TinyML is a new technology that lets ML models run on cheap, low-power devices, avoiding these problems. Notably, TinyML can contribute to the SDGs and scientific research in fields like environment, physics, and energy.

• *From the speakers*

Zihan Kan

Individuals are often exposed to multiple environmental factors simultaneously, and understanding their joint effects is essential for developing effective public health policies. However, there has been a lack of research examining individual exposure to combined environmental factors during daily mobility. To address this gap, this study investigated the relationships between and geographic patterns of individual exposures to air pollution (PM2.5), noise and greenspace using individual-level real-time GPS and mobile sensing data collected in outdoor environment. The findings of this study suggest that the relationship between individual exposures to air pollution, noise and greenspace varies across different value ranges of environmental exposures. The study also reveals that exposures to multiple environmental factors exhibit spatial heterogeneity and strong clustering patterns. These results highlight the importance of considering spatial heterogeneity and proximity of environmental exposures in understanding the relationships between multiple exposures in environmental health research.

Marco Zennaro

AI can help achieve the UN's SDGs, but it faces challenges such as high-power use, connectivity needs, and cloud costs. TinyML is a new technology that lets ML models run on cheap and low-power devices, avoiding these problems. We think TinyML can contribute to the SDGs and scientific research in fields like environment, physics, and energy. We introduce an initiative that builds and supports a global network of universities working on TinyML in developing countries. We propose more open educational resources, South–South academic cooperation, and pilot projects of large-scale TinyML solutions for the SDGs.

JUDICIAL PROCESSES: A TRANSPARENT AND RESPONSIBLE APPROACH

Chair

Walter Gehr, Genral Directorate for Cultural Affairs, Austrian Federal Ministry for European and International Affairs, Austria

Speakers

Fernando Buarque (Senior Associate Professor of Computing(AI), School of Engineering, University of Pernambuco, Brazil)
Teng Hin Ip (Economics Panel Chairperson, Sacred Heart Canossian College (English Section) Macau)
Vincent Mossfield (Regional Director, Liability Risk Practice, WTW Asia)
Sara Migliorini (Assistant Professor of Global Legal Studies at the Faculty of Law of the University of Macau)
Eliamani Laltaika (Judge of the High Court of Tanzania and an adjunct faculty member of The Nelson Mandela African Institute of Science and Technology (NM-AIST), Arusha Tanzania)

• *Session Overview*

The session highlighted how software applications can be useful in judicial systems. An example of the application "Logos" and its potential to assist the Brazilian judicial system in writing judgments was given. Logos collects data to provide judges with decision recommendations and detailed explanations, producing coherent draft judgments. The session also examined the areas of law most affected by AI, emphasizing Human Rights and Humanitarian Law. Algorithmic discrimination and the impact of automated weapons on the law of war were highlighted as significant concerns. Specific liability risks associated with AI were discussed, including issues in cyber, contract, employment, copyright, medical, and product liability. It was stressed that AI systems cannot replace ultimate human responsibility and accountability. It was further noted that the UNESCO Recommendation on the Ethics of Artificial Intelligence underlines that life and death decisions should not be delegated to AI systems. The session also referenced China's Personal Information Protection Law (PIPL) and the EU's General Data Protection Regulation (GDPR), affirming individuals' rights to opt out of automated decision-making. Additionally, the session addressed the challenges the existing copyright framework faces with Generative AI and AI-generated content. The need for copyright law reform was emphasized to ensure legal certainty for investors and facilitate innovation financing. This is particularly important given the growing interest from artists and programmers in the potential of generative AI as an art medium. Overall, the session provided a comprehensive overview of AI's impact on various legal sectors and the associated ethical and legal considerations.

• *From the speakers*

Fernando Buarque

In 2021, the Brazilian Judiciary concluded nearly 27 million cases, with over 60 million cases still in progress at the turn of the year. Handling such a substantial caseload comes at a significant cost, with over 100 billion reais spent (just over 20 billion dollars) in 2021 alone. The Judiciary aims to safeguard individual, collective, and social

rights while resolving conflicts among citizens, entities, and the State. Its proper functioning is crucial for the country, and if it fails to adequately serve the Brazilian people, there will be losses not only in financial terms but also in social aspects, potentially impacting human lives. Given the scenario's importance on the social, financial, and human aspects, investing in ways to optimize and enhance the systems and methodologies used in the sector becomes crucial for delivering a swift and fair response. Considering this context, we propose an automated legal document suggestion system that focuses on factors such as explainability, transparency, and responsibility. Our method utilizes an expert system and based on the data of each case, it suggests a document for the next step in the process. While similar results could be achieved using transformers or other technologies, we opted for the expert system for its ability to provide full transparency and explainability. For every document suggested, we include an accompanying explanation, allowing the user to verify the recommendation. Additionally, if necessary, we can display the complete path and values used to generate the suggested answer. Furthermore, we also had a concern regarding the aspect of responsibility; hence, our system was developed with a focus on supporting the user's decision rather than replacing it. Throughout the system's usage, we remind the user to verify all information and suggestions provided by the system. This approach aims to enhance the speed of decision-making while maintaining quality and a human touch in the process.

Eliamani Laltaika

Law broadly defined, plays three main roles in regulating AI: 1. Facilitative, 2. Permissive, and 3. Prohibitive roles. Premised on recently enacted legal instruments (both International and municipal) and court decisions related to AI, this paper highlights successes, identifies gaps, and suggests the way forward for balanced regulatory processes. Specifically, the paper calls for avoidance of overtly prohibitive approaches that may inhibit innovation without undermining IPRs, Data Protection and privacy.

Teng Hin Ip

Since the Macao SAR government has now adopted the "1+4" adequate economic diversification strategy, there is a need to reform Macao's copyright legislation as it can foster creation and its local cultural industry. For this purpose, this presentation explores the challenges and debates surrounding generative artificial intelligence (GAI) and the treatment of AI-generated content (AIGC) under the copyright law of the Macao Special Administrative Region (Macao SAR). It discusses four important legal questions raised for copyright law by GAI, including the recognition of AI authorship, the protection of AIGC, copyright issues of the pre-training data, and the protection of the GAI itself. This presentation first examines AI authorship within the provisions in international law and different domestic copyright legislations, such as the Macao Special Administrative Region, the European Union, the United Kingdom, and the People's Republic of China. To understand the impact of GAI on copyrighted works and the current practice to regulate the use of artificial intelligence, a comparative analysis of the European Union's Artificial Intelligence Act and relevant AI regulations in the PRC, such as the Interim Measures for the Management of Generative Artificial Intelligence Service, will be conducted. This presentation aims to offer practical insights for legal reforms and adaptations of Macao SAR's copyright legislation to the challenges raised by GAI. It proposes a copyright regime that upholds human authorship, protects related rights for AIGC, and advocates the opt-in approach that ensures the authorized use of training data.

Vincent Mossfield

Artificial Intelligence (AI) technology has the potential to impact risk exposures across a broad spectrum of liability insurances for Asian businesses, including product quality, product safety and professional liability insurance. According to a recent insurance industry report, the producers and sellers of AI products may bear the risk of product and safety liability. For example, under Chinese regulations of Tort Law and Product Quality Law, the producers of new products that include AI, have more characteristics of high technology, automation, and less artificial operation. Therefore, damage to a third-party person caused by AI technology is more likely to be caused by quality problems of the products themselves, In addition to the above, users of new technology such as AI, without adequate supervision and controls, may face fresh risk related challenges including, the potential for copyright infringement, data privacy and security risks, and liability for an errors or inaccuracies in the new technology. This presentation will highlight the main liability risk and insurance implicants of AI technology for Asian based businesses, briefly touch on recent AI related liability cases, and explore the likely insurance industry response to AI related products and services.

AI AGENTS IN PRACTICE: HARNESSING AI FOR ALL

Chair

Jia An Liu (Research Fellow at UNU Macau)

Speakers

Chu Chu (Ph.D. Candidate, Journalism School, Fudan University; Communications Fellow, UNU Macau)
Zhiqing Xiao (Ph.D. student in Computer Science at Zhejiang University)
Yilin Zhao (PhD candidate in international law at Zhejiang University)
Goshi Aoki (Master's student in Computer Science at Zhejiang University)
Yanzhuo Li (Ph.D. student in International Affairs and Global Governance at Zhejiang University)
Liting Chen (Master's Student, International Organizations & Global Development, Zhejiang University & University of Manchester)

• *Session Overview*

The session discussed the practical applications and challenges of AI agents. Key points included the phenomenon of hallucination in large language models and biases in their responses. The transformative potential of AI agents was emphasized, particularly in making information more accessible and considering the ethical dimensions of their deployment. The importance of a human-centric approach in AI development and the role of international law in harmonizing global AI regulations were underscored. Reinforcement learning was also explored through practical examples, demonstrating its utility in preparing AI models for sophisticated tasks like gaming.

Despite advancements, the challenges in achieving human-like intelligence and comprehension were acknowledged. Speakers highlighted AI's capacity to empower marginalized communities and foster inclusivity. AI tools that convert speech to text, simplify complex writing, and enable multilingual communication were mentioned as potential equalizers for individuals from varied backgrounds. These tools can bridge the literacy divide and foster a more inclusive society by making information more accessible and understandable. The fragmentation of international law due to varying policies and initiatives was discussed, advocating for a unified, human-centric approach to AI regulation. The necessity for international collaboration to navigate legal fragmentation and steer AI developments towards reducing disparities was emphasized. Additionally, innovative strategies for global poverty reduction were explored, focusing on AI and agent-based policy simulation. Finally, the session highlighted how AI can provide multidimensional insights, analyze complex data, and assist in developing policies to address poverty.

• *From the speakers*

Jia An Liu and Chu Chu

The rapid development of Large Language Models (LLMs) has catalyzed a new era in the creation of AI Agents, enabling advancements across a variety of domains including social simulation, computational social science, and interactive media. This study explores the historical trajectories, current applications, and future trends of AI Agents, with a particular focus on the transformative role of LLMs-based agents and their integration in agent-based modeling (ABM). The study examines the evolution of LLMs from their inception to their current status as sophisticated tools capable of simulating complex human behavior and executing intricate tasks within virtual and real-world settings. We explore several key applications of LLM-based agents, including their role in simulations of social behaviors, human interactions, decision-making processes, and policy simulations which are critical for understanding and addressing global challenges such as health crises, emergency responses, and environmental changes. We highlighted pressing challenges such as the potential for bias propagation and ethical dilemmas associated with autonomous systems, particularly in the context of misuse like autonomous weaponry. By focusing on diverse applications and outlining both the technological and ethical landscape, this work underscores the importance of multidisciplinary approaches in harnessing the potential of AI Agents to contribute to the Sustainable Development Goals (SDGs). Through this exploration, we advocate for a balanced approach to AI development, prioritizing ethical considerations and human-centric values, emphasizing the need for global governance frameworks to ensure ethical and effective deployment.

Yilin Zhao and Guiqiong Chen

(1) The AI governance framework should include the non-governmental sector. Multilateral cooperation is well-appreciated.
(2) In view of their roles in global governance, we believe enterprises & NGOs can act as a bridge between the fast-evolving AI landscape and the steady formulation of governance frameworks.
(3) Following global talks on AI development and governance should empower the industrial integration concerning digital humanism.

Goshi Aoki

A key takeaway was the effective use of a multi-step AI-driven process to combat illiteracy. This process includes:
1. Converting spoken language to text using Google Cloud Speech-to-Text, making spoken content accessible in written form.
2. Simplifying complex text with tools like Anthropic Claude, enhancing comprehension for early learners.
3. Translating content into multiple languages via OpenAI's ChatGPT, expanding accessibility.
4. Converting text back to speech with Meta Voice Box, aiding those still developing reading skills.
This approach showcases AI's potential to create inclusive and accessible educational solutions globally.

Yanzhuo Li

In the era of AI and big data, understanding the impact of artificial intelligence (AI) on social science research (SSR) is crucial. This presentation explores the potential of AI agents to revolutionize SSR, focusing on prediction accuracy, causal explanations, and the limitations of traditional research methods. Drawing on the concept of the 5th paradigm of scientific discovery, which emphasizes data-driven and AI-driven research, we discuss successful cases in natural science research and propose extending AI's influence on social sciences. Current AI applications in SSR, such as literature review and data analysis, are examined, along with their challenges, including trustworthiness and limited knowledge of current events. This presentation introduces AI agents as a solution to enhance the effectiveness and reliability of AI usage in SSR, discussing their definition, features, and potential to improve decision-making and behavioral simulations. Examples of its application in validating game theory, general election results prediction, and assessing war possibilities are introduced and discussed in detail. Ethical considerations and competing voices regarding the use of AI in SSR are also addressed, highlighting concerns such as bias and elitism. By critically evaluating the strengths and limitations of AI applications in SSR, this presentation aims to provide researchers and practitioners with valuable insights into harnessing AI's potential to advance the field.

Liting Chen

This research explores innovative methods in global poverty reduction, focusing on AI applications and agent-based policy simulations. Poverty, defined variably by international organizations, encompasses material and non-material deprivations. This multifaceted nature requires comprehensive strategies beyond mere survival metrics.
AI's direct contributions include advanced poverty measurement and area identification through tools like Stanford University's deep learning models using satellite imagery. Indirectly, AI enhances sectors such as agriculture and disaster resilience, exemplified by Google Research's flood forecasting system. From a social structure perspective, AI can address poverty issue and underlying societal inequalities by providing comprehensive data and simulations to inform policy. The integration of AI in policymaking through agent-based modeling (ABM) presents a significant advancement. ABM simulates interactions within populations, aiding in the analysis of human and natural system dynamics. However, its application in large-scale policy formulation is limited due to challenges in capturing broad population dynamics. This has led to the development of multi-agent systems

(MAS), which offer robust performances by allowing agents to independently solve problems using shared data. An example is the Aporophobia Agent-Based Model, which emphasizes societal responsibility in addressing poverty.
Looking ahead, AI agents hold promise for more automated and scalable policy simulations, overcoming current data constraints. However, the dual nature of technological progress necessitates caution. Disparities in technological access between low-income and developed countries raise concerns about widening the digital divide. Ensuring equitable benefits from AI advancements requires significant global cooperation and investment in technology transfer.

DIGITAL HUMANISM – AN APPROACH TO MASTER THE GLOBAL CHALLENGES OF TECH POWER

Chair
Hannes Werthner (Retired Computer Science Professor at the TU Wien, Austria)

Speakers
Rostam Josef Neuwirth (Professor of Law and Head for Department of Global Legal Studies at the University of Macau)
Xingzhong Yu (Chair Professor at the Faculty of Law at the University of Macau)

• *Session Overview*

The session delved into digital humanism and its significance in the ongoing digital transformation. The discussions covered economic, cultural, and societal dimensions, highlighting the dominant influence of IT platforms and AI companies on the digital landscape – particularly in terms of market dominance and social impact. Digital humanism was presented as a technological approach that benefits society while upholding human values and ethics, with principles such as safeguarding human rights, promoting education, and fostering knowledge creation. The speakers emphasized the need to navigate technological advancements while prioritizing societal well-being and global cooperation in AI governance, considering diverse regional regulatory approaches. The human-centric approach was mentioned as critical in technology development and governance, promoting philosophical reflection and consensus-building to address digital humanism complexities and dynamics. The widening gap between artificial and human intelligence was noted, and how the fusion of diverse ideas encapsulates the core of digital humanism. Besides, legal challenges in AI were highlighted, advocating for digital humanism to counterbalance technological overreliance and human values. The session further emphasized digital humanism's role in addressing governance challenges through philosophical inquiries and fostering a human-centric philosophy in technology development. Overall, the session highlighted the foundational principles of digital humanism, its societal implications, and the necessity of ethical considerations and collaborative efforts in shaping a digital future aligned with human values and societal needs.

INTEGRATING AI WITH COMPLEX SYSTEMS MODELLING TO ACHIEVE THE SDGS

Chair
Serge Stinckwich (Head of Research, UNU Macau)

Speakers
Emanuele Pugliese (Researcher, UNU-MERIT)
Jesse Lastunen (Research Associate, United Nations University World Institute for Development Economics Research (UNU-WIDER))
Zaber Moinul (Senior Academic Fellow, UNU-EGOV)

• *Session Overview*

The first presentation of the session discussed the SOUTHMOD project at UNU-WIDER, highlighting efforts to develop tax-benefit microsimulation models for the Global South. These models aim to aid researchers and policymakers in evaluating tax and social protection policies, improving domestic tax revenue, and enhancing social protection systems in low- and middle-income countries. SOUTHMOD, which encompasses 13 models across Africa, Latin America, and Southeast Asia, focuses on facilitating evidence-based policymaking. The project also emphasizes capacity development through a free online course and in-person workshops, aiming to integrate microsimulation into policy evaluation processes for equitable development. The second presentation delved into implementing Explainable Artificial Intelligence (XAI) for public policy decision-making in rapidly changing urban areas of the developing world. XAI is critical for providing transparency and interpretability in AI algorithms, enabling policymakers to understand and trust the insights generated. However, implementing XAI faces significant technical and institutional challenges, such as limited access to high-quality data, biases in datasets, and the complexity of AI models. Additionally, the lack of comprehensive AI policies and regulations in developing countries raises concerns about privacy, accountability, and fairness. Finally, the session highlighted the participatory modelling approach aimed at integrating non-scientists and stakeholders into designing agent-based models for disease outbreaks. Partnering with African Population and Health Research Center in Kenya, the project involved extensive stakeholder engagement. Key outcomes included a role-playing game, "Citizen Outbreak Responder," and an agent-based simulation, combining participatory insights with computational modelling to understand outbreak dynamics and policy implications.

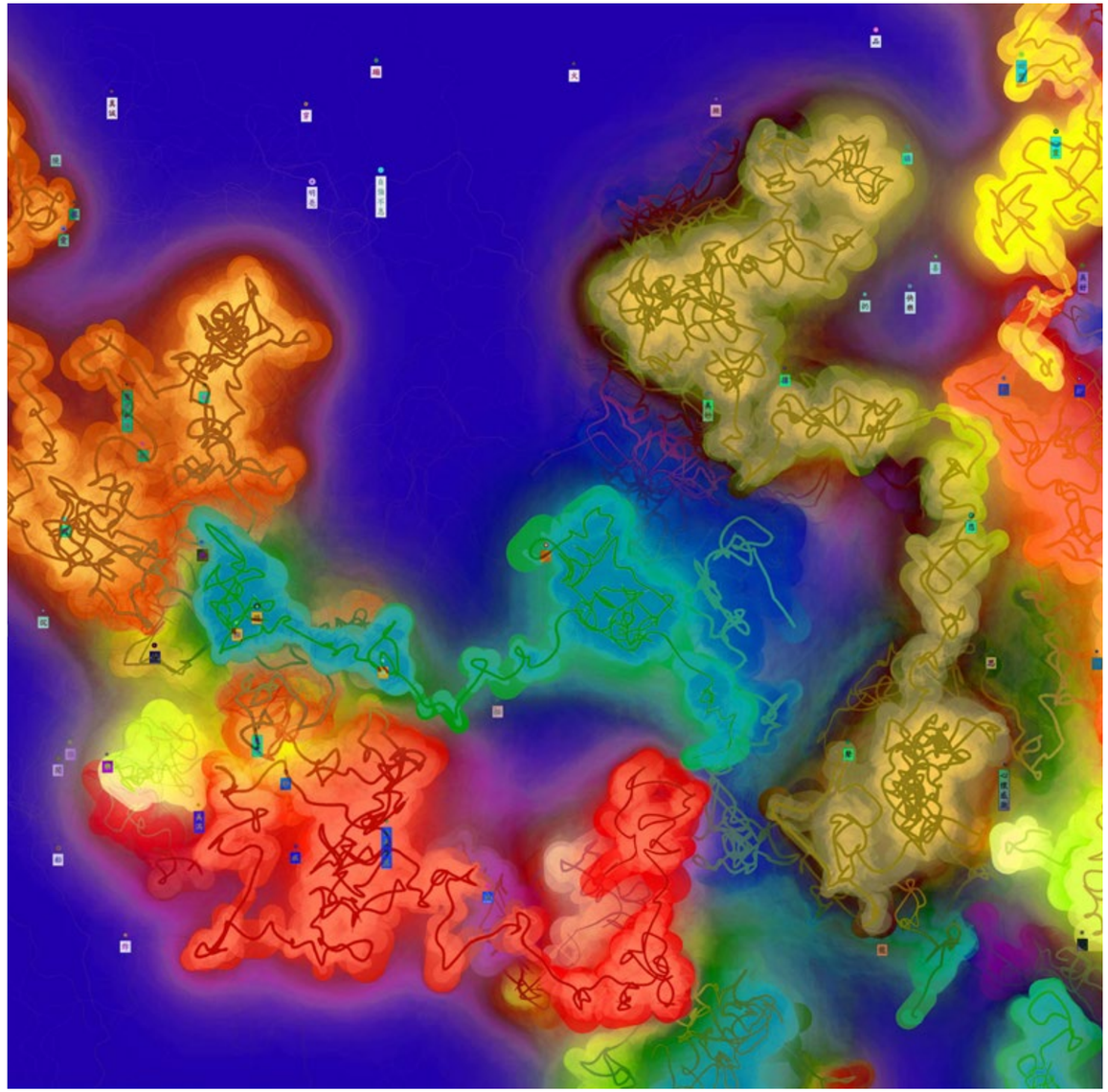
• *From the speakers*

Jesse Lastunen
This presentation discusses the SOUTHMOD project at UNU-WIDER, detailing the collaborative efforts to develop tax-benefit microsimulation models for the Global South. The project aims to provide researchers and policymakers with reliable tools and information to improve tax and social protection policies. The models can be used to evaluate the distributional and budgetary effects of tax-benefit policies and related reforms, also enabling cross-country policy comparisons. SOUTHMOD hosts 13 models across Africa, Latin America, and Southeast Asia. The project emphasizes the need for microsimulation in low- and middle-income countries to improve domestic tax revenue mobilization and scale social protection systems. Through detailed documentation and annual updates, SOUTHMOD models offer a robust

foundation for policy analysis for governments and related research by academics. Apart from modelling and research, capacity development is a core component of the project. SOUTHMOD offers a free online course on microsimulation as well as in-person workshops designed to build up local expertise. The main goal of the project is to integrate microsimulation into the policy evaluation processes of developing country governments, facilitating evidence-based policymaking for equitable development. The presentation also highlights recent research undertaken using the models, focusing on the effectiveness of various taxes and benefits in reducing inequality and poverty and the distributional effects of hypothetical policy reforms across different countries. These simulations provide insights into cost-effective policy reforms that would help fight poverty and inequality in the Global South.

Zaber Moinul
Implementing Explainable Artificial Intelligence (XAI) for public policy decision-making in rapidly changing urban areas of the developing world holds immense importance yet poses significant challenges. We shed light on both the importance and challenges of integrating XAI into decision-making processes within these contexts. In rapidly changing urban areas of the developing world, where demographic shifts, technological advancements, and environmental concerns are prevalent, the need for informed and equitable public policy decisions is paramount. XAI offers the potential to enhance decision-making by providing transparency and interpretability into the workings of AI algorithms, thereby enabling policymakers to understand, trust, and act upon the insights generated. However, implementing XAI in such settings presents several technical and institutional challenges. From a technical standpoint, limited access to high-quality data, biases in datasets, and the complexity of AI models pose significant hurdles. Moreover, the lack of technical expertise and resources exacerbates these challenges, hindering the development and deployment of responsible AI systems. On the institutional front, issues such as regulatory frameworks, governance structures, and ethical considerations need to be addressed. Developing countries often lack comprehensive policies and regulations governing AI, raising concerns about privacy, accountability, and fairness. Additionally, building trust and acceptance among stakeholders, including policymakers, citizens, and civil society, is essential for the successful implementation of XAI in public policy decision-making. While XAI holds great promise for improving public policy decision-making, addressing the technical and institutional challenges is imperative. Collaborative efforts involving governments, academia, industry, and civil society are needed to overcome these challenges and ensure the responsible and equitable deployment of XAI for the benefit of society.

Serge Stinckwich
Evaluating the Sustainable Development Goals is a highly complex task, as it involves multiple dimensions (economic, social and environmental), scales (global, regional, national) as well as some cultural factors. Researchers have already created analytical tools and models to examine specific aspects of sustainable development, aiming to understand the connections among them. Computational models such as agent-based models or micro-simulation are increasingly used to support the development, implementation and assessment of public policy. As Artificial Intelligence decision-making tools like ChatGPT are more and more employed to create or complement these computational models, it becomes important to understand the challenges and risks of this integration.



AI AND CAPACITY BUILDING

AI, CHILDREN AND YOUTH

Chair
Jaimee Stuart (Chair, Senior Researcher - Team Lead, UNU Macau),

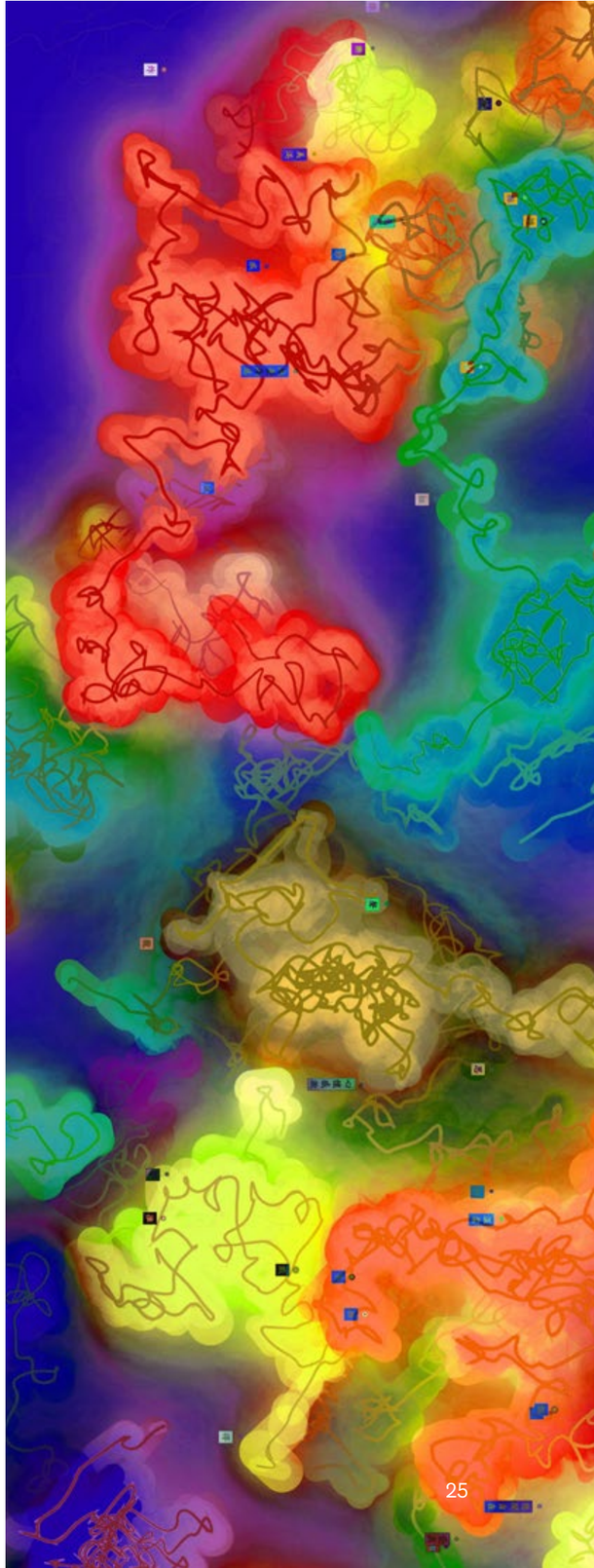
Speakers
Alicja Pawluczuk (digital [in]equity Research Fellow at Leeds University's INCLUDE+ Network & Founder of the Digital Youth Work Research Hub, and Former ICTD Research Fellow at UNU Macau)
Yi Li (PhD Candidate at the Faculty of Law of the University of Macau)
Li Ming Wen (Director, Population Health Research & Evaluation Hub, Sydney Local Health District; Clinical Professor, Sydney School of Public Health, The University of Sydney)

• *Session Overview*

AI has become an important part of many children's and young people's lives, impacting their education, work, privacy, and participation in social life. The session explored the convergence of digital technology, foresight, and youth engagement. The speakers emphasized both the potential risks and benefits of digital technology and the critical role of young adults in its evolution. The presentations reframed the discourse around digital technology, focusing on cyberbullying and the broader implications of digital spheres, including the impact of AI on youth. The session emphasized the vital role of non-formal education in bridging gaps between schools and parents. It highlighted how settings like sports and coding clubs provide opportunities for young people to acquire skills not covered in formal curricula. These spaces are trusted environments where youth workers can address issues such as digital citizenship, democratic participation, and climate change. The impact of digital technologies on education was discussed, emphasizing the need to frame topics like human rights within digital transformation. Moreover, the presentation on AI's impact on society and children discussed the rapid acceleration of AI technology and its transformative applications. The talk highlighted the need to clearly define childhood and the unique challenges children face in an increasingly AI-driven world. The importance of a proactive and adaptable legal approach to protect children's rights amidst technological advancements was emphasized, encouraging the UN and UNICEF to shape global policies and raise awareness about AI's ethical and social implications for children's welfare.

• *From the speakers*

Jaimee Stuart
Generative Artificial Intelligence (GenAI) is now well established as a part of life for many youth people who have rapidly adopted these tools for work, study, and interaction purposes. However, our understanding on how and why youth use GenAI tools is limited and as suggested by UNICEF (2023) there is a strong need to fill the gaps in our knowledge and to understand better the potential risks and opportunities of these technologies for youth. Notably, UNICEF recommends engaging in foresight with young people for better anticipatory governance. Following this call, we surveyed 702 young adults aged between 18 – 25 years old concerning their uses, motivations, and outcomes of engagement with GenAI. We specifically asked participants how they feel about GenAI and what they perceived were the risks and opportunities of GenAI for children and young people globally. The majority (67.8%) reported feeling generally positive about GenAI, 25.7% felt neutral, and less than 6.3% felt negative. However, there were a wide range of risks and opportunities identified, with common themes offering interesting and important dichotomies; specifically the nature of GenAI as offering (1) useful, accessible, and meaningful information but also as potentially inaccurate, fake, and unreliable as well as threatening to privacy, (2) GenAI as a tool for supporting for education and learning while also being a potential pathway for dependency and lack of critical thinking, and (3) GenAI as provided opportunities for work and study while at the same time creating uncertainties for education, creativity and work in the future. The research findings are discussed in line with UN call to engage youth in meaningful participation and action concerning contemporary global issues, and the implications of experiential accounts of AI-Anxieties and uncertainties are explicated. We propose a set of future research and action directions to leverage these insights.



Alicja Pawluczuk
The emergence of Artificial Intelligence (AI) has had a visible impact on the meaning and the practical implementation of youth work in Europe (European Commission, 2022). From the use of Chatbots for online youth counselling to Virtual Reality goggles (VR) for media literacy learning, Artificial Intelligence (AI) has become increasingly present in non-formal education settings. AI-powered solutions also provide youth work spaces with new creative opportunities, and project management tools allow practitioners to save on administrative tasks and spend more quality time with young people. However, there is also the darker side of AI's presence in the non-formal educational sector. For decades, youth work has aimed to enhance social inclusion, empower young people to become critical thinkers, and pursue authentic and meaningful communication between youth workers and young people. Nowadays, many AI-powered youth-oriented tech solutions or social media platforms might affect these processes in unexpected ways. Young people - and therefore also youth workers - need to know how to continue to critically examine, learn, and find one's way in an increasingly AI-driven way to respond to the ever-changing socio- economic dynamics. The overall AI adoption market is expected to be worth $190 billion by 2025, and most jobs of the future will require young people to have digital competences (World Economic Forum, 2022). As digital transformation continues to shape the socio-cultural norms and landscape, digital competences will also be central to young people's democratic citizenship and democratic education. It is certain that algorithms and AI continue to influence young people's everyday decision making and the overall process of digital transformation, thus the role of education [formal and non-formal] is to ensure they are doing so in an informed, critical, and conscious way. Youth work, often navigating a complex, dynamic, and somewhat unregulated AI-power landscape, faces challenges in understanding and harnessing these technologies effectively (Siruala, 2021). There is a lack of comprehensive knowledge about how youth workers perceive and interact with AI in their practice. This paper seeks to explore the presence and impact of AI in European youth work and the non-formal education sector, particularly focusing on youth workers' perceptions. It aims to offer insights and recommendations based on a qualitative analysis that includes expert interviews, surveys, and participatory workshops as part of the AI research project managed by the Youth Partnership between the European Commission and the Council of Europe in the field of youth. The recommendations cover four thematic areas: Co-designing AI applications in European youth work Recognising the youth work sector as a stakeholder in AI-related discussions Developing new AI-focused training and support mechanisms. Encouraging AI experimentation, speculative design, and innovation within youth work. This study contributes to the ECREA2024 by providing a new understanding of AI's role in youth work and offering actionable strategies for its effective integration.

Li Ming Wen
Early childhood is a critical time to establish healthy child development and improve life-long health outcomes. The UN Sustainable Development Goal (SDG) 3 aims to ensure healthy lives and promote well-being for all at all ages. Also, as stated by the World Health Organization, enabling young children to achieve their full developmental potential is a human right and an essential requisite for sustainable development. Families play a critical role in nurturing care that children need to develop in the beginning of life. However, many parents and other caregivers need support from healthcare professionals to enable them to put nurturing care into practice. Over the years in Sydney Australia, we have developed Healthy Beginnings program (funded by NHMRC) which is a staged early childhood health promotion program delivered by early childhood nurses. The program supports women during pregnancy and postpartum, targeting healthy infant feeding practices, nutrition, physical activity, and healthy growth. At the early stage of the program development, the Healthy Beginnings program was delivered via nurse home visits. However, face to face health promotion programs have high delivery costs, potentially limiting their population reach, sustainability, and cost effectiveness. We then developed and tested a telehealth approach using telephone or electronic communication tools for delivering Healthy Beginnings program, which provides a potential alternative to the face to face approach and overcomes some of its limitations. The telehealth model was valuable during the COVID-19 pandemic when most face-to-face health services were suspended. It shows promising effects healthy growth of young children. The Healthy Beginnings program has now been translated into a globally recognised suite of evidence-based programs that build sustainable health promotion programs for all communities. We are currently in the development of an interactive web-based Healthy Beginnings program with a Chatbot feature for promoting healthy growth for all children in the world. This presentation will be covering the journey of developing the Healthy Beginnings suite of programs including concept generation, project development, implementation, outcome evaluation as well as challenges and opportunities in the digital era.

Yi Li
AI and digital technology have become a fundamental part of children's daily lives. Globally, children frequently engage on social media platforms and use apps, websites, and online games all promoted by AI-powered algorithms, which is rarely all good or all bad. On the one hand, the multiple modes of the digital world allow children to freely express themselves and discover the world but also present additional risks, including the threat of online predators, data management, privacy concerns, prejudice in society, and equity issues. Children are more susceptible to hateful, harmful, or offensive content and potentially harmful advertising because of their immature personalities. As a result, a key concern in AI governance is how to safeguard children's rights in the age of AI. In 2021, UNICEF developed 'Policy Guidance on AI for Children', and UNCRC further published General Comment No. 25 on 'Children's Rights in Relation to the Digital Environment'. The OECD approved the 'Recommendation on Children in the Digital Environment' and 'Guidelines for Digital Service Providers'. In 2022, WEF proposed the 'Artificial Intelligence for Children toolkit'. China adopted several provisions pertaining to children's rights in cyberspace at the national level. Otherwise, 'Interim Measures for the Administration of Generative Artificial Intelligence Services' and 'Basic Security Requirements for Generative Artificial Intelligence Service' require further security precautions to protect children from addiction. This paper analyzes and compares the guidelines, regulations, and laws from national and

global perspectives. After that, it gives a detailed overview of the field of children's rights regarding AI technology. It is important to acknowledge the conflict between the advantages of children's access to the Internet, and the potential risks they may encounter. Lastly, it suggests specific steps that should be taken to safeguard children online. Urge the tech sector to evaluate the risks that minors encounter and to provide solutions that prioritize the rights of minors in the development of digital platforms and products. The legislation should be strengthened to quickly adapt to the changing environment and ensure that it is globally consistent.

AI, EDUCATION, AND MARGINALISATION

Chair
Ronald Musizvingoza (Researcher, UNU Macau)

Speakers
Angelina Maria (Lecturer in translation studies at the Faculty of Humanities and Social Sciences, City University of Macau),
Salvatore Mancuso (Professor of Comparative Law and Legal Anthropology, University of Palermo)
Xiaohong Zhu (Graduate student, Hangzhou Normal University)
Linda Mendo Abessolo (Data Privacy & AI Compliance, Activist for Digital Inclusion, and Founder of "Cameroon Women First Association")
Kaize Zhu (Incoming PhD student at the City University of Hong Kong)
Liangyue Zhang (Ph.D. student in Journalism and Communication Studies at Fudan University)

• *Session Overview*

AI and Education intersect in many ways, revolutionizing learning experiences and empowering students with personalized, data-driven insights. This session explored different dimensions of AI and its impact on education, socio-political concerns related to algorithms, including data profiling, privacy issues, and algorithmic neo-colonialism, particularly in African countries. It highlighted concerns regarding AI translation in education, particularly its potential to exacerbate educational disparities between high-income and low-income countries. Emphasis was placed on the necessity of standardized criteria and rigorous evaluation of AI translation tools to uphold quality education standards universally. Moreover, the discussion underscored the pivotal role of data quality and cultural sensitivity in algorithm training. Criticism was directed towards the unchecked exportation of Western algorithms to Africa, termed digital colonialism, stressing the imperative for culturally contextualized algorithm design. Additionally, the session delved into AI's transformative potential in assisting individuals with disabilities, stressing the importance of inclusivity and collaborative research efforts. It also highlighted issues concerning the visibility and empowerment of marginalized groups, such as African black women, alongside advocating for robust data privacy measures. Furthermore, discussions revolved around attitudes towards technological change and the challenges posed by AI integration, emphasizing strategies for equitable AI access and integration into education. The session also highlighted concerns regarding the proliferation of AI-generated content and the imperative for stringent legal frameworks to mitigate its adverse effects, especially on mental health. Overall, the session addressed AI's multifaceted influence on education, governance, and social equity, emphasizing the need for an inclusive approach to ensure equitable outcomes.

• *From the speakers*

Angelina Maria
The current generation is now able to access numerous materials that were formerly blocked by language barriers through the introduction of various AI translation tools from ChatGPT to DeepL. With academia generally agreeing that AI translation machines are beneficial to language learning and that they allow students to be exposed to a wider range of information, AI translation is now frequently employed as a subsidiary tool in educational institutions, especially in developed countries. While it seems that the development of AI translation is providing new opportunities for better education, this research suggests that new challenges arise. By case studies, this research proposes two questions to be considered: (1) If the introduction of AI translation to education is a new opportunity, will this new opportunity recreate a wider educational gap between the high-income and low-income groups, thus going against the idea of ensuring 'inclusive education for all'? (2) Is there any standard for the output of the AI translation machines to guarantee this new opportunity is drawing close to 'quality education', instead of just providing a new, but worthless means of learning? Through this research, the author would like to raise the awareness of potential challenges of AI translation to Quality Education that might previously be overlooked, and to initiate alternative solutions to the said issue.

Salvatore Mancuso
Undoubtedly, algorithms are shaping our future and our life. In a very simple way, the algorithm can be defined as a step-by-step process to reach the solution of a problem. They are now able to solve problems regarding conflicting objectives that change over time. They can immediately draw conclusions from the analyzed data, helping humans reach decisions in different situations. Algorithms are already used in several fields, e.g. to help medical diagnosis, or to simplify public selection procedures, or to reach a judicial decision. As a disruptive technology, algorithms have great potential, but data are a necessary requirement. Profiling activities have therefore become essential to realize efficient data collection. Through various technologies (from the simple analysis of individual web browsing data to software for biometric identification - e.g., facial recognition), profiling allows an intrusion into the individual sphere. The collection, analysis, and manipulation of sensitive data potentially entails monitoring, tracking, and surveilling people, leading to new technological forms of exploitation of the human being - such as virtual chains that replace the real ones. Scholars have been talking about "digital colonialism" for a while; perhaps, a more correct definition could be "algorithmic neo-colonialism". The algorithmic invasion of African countries, in fact, does not come only from big Western corporations, but wider programs are involved, such as the Chinese "digital silk road" as part of the Belt and Road initiative. The protection of human rights and individual privacy and the creation of an equal society is clearly the last concern of these different actors. When such practices involve "mining" data, building predictive models, or any personal decision making, social outcomes fall under

control of predictive systems. Furthermore, the classical risks posed by a data-driven approach to decisions (unpredictability, data bias, process inexplicability and the like) may result reinforced in the context of African countries, causing harms to individuals or groups that are often already discriminated. We are discussing a subtler form of influence and control which might be therefore more pervasive and dangerous and does not reach domination through weapons but through pervading or even intrusive technological tools. Furthermore, we face today a sort of challenge, a race between transnational actors to reach the first and most complete regulation on Artificial Intelligence; in a context like the African one, affected by a historical dependence on third States and international organizations, the risk is that the countries of the continent will be prevented from seizing various opportunities, being excluded from the race for regulations and induced towards legal solutions which are not new but already adopted elsewhere. Algorithms in Africa must serve the local communities and must not be blindly imported from Western countries, to make artificial intelligence a useful resource for realizing the continent's cultural and traditional communitarian values.

Xiaohong Zhu

Purpose: People with disabilities frequently encounter systemic discrimination within societal structures, resulting in disparities in education, employment, healthcare, and social integration. The rapid advancement of artificial intelligence (AI) offers a new potential to address these inequalities. The purpose of this paper is to investigate the prominent areas of AI application within the disabled population, analyze the emerging trends, and discuss the role of AI in diminishing societal inequalities for disabled individuals, while also examining the methods by which AI can provide opportunities and resources. Method: Web of Science (WOS) was used as the data source, with a search period from inception to December 31, 2023. And the language was limited to English. After screening out irrelevant documents, R, VOSviewer, and SCImago Graphica software were used to perform a visual analysis of the relevant articles, creating knowledge maps for publication output, country, keywords, research hotspots and trends. Results: A total of 1805 related papers were retrieved in WOS, and 665 articles were included, demonstrating a positive trend in annual publications. The United States emerged as the leading country in terms of publication volume, with 118 articles, accounting for 17.7% of all included papers. India and China followed suit. The University of Pittsburgh in the United States is one of the institutions with the highest production in this field. The most cited reference article is "A survey on robotic devices for upper limb rehabilitation". The top five keywords by frequency were "deep learning" "technology" "rehabilitation" "design" and "system". Conclusion: All articles included comprehensively encapsulate the applications of AI in areas such as assistive technologies, accessible environments, and inclusive design for people with disabilities can improve the quality of life for people with disabilities. The development and application of artificial intelligence can contribute to improving the quality of life for people with disabilities, helping to address existing inequities and providing them with more opportunities and resources, thus achieving social inclusion and fairness. However, the development and use of AI technology can also exacerbate inequalities. For example, if AI systems fail to accommodate the needs of people with disabilities due to design flaws, it can result in their exclusion from certain technological applications. Therefore, further strengthening policy support, technological innovation, and social awareness is necessary to fully harness the potential of AI in reducing social inequality for people with disabilities. Future research should focus on the long-term impact and sustainability of AI in the disabled community, as well as how to maximize inclusive development and social justice. For instance, choosing representative individuals from different disabled groups to participate in the design of systems, making them part of the team rather than designing for them, can reduce biases and marginalization in systems and algorithms.

EMPOWER YOUNG SCIENTIST, ACCELERATE AI DEVELOPMENT

Chair

Jane Wu (Executive Director/Executive Secretary General, Venture Cup China/World Young Scientist Summit Secretariat)

Speakers

Sjoerd Dikkerboom (Officer for Innovation, Technology and Science, Consulate General of the Kingdom of the Netherlands in Shanghai)
Chao Zhou (Senior Engineer, Nano and Advanced Materials Institute Limited)
Kai Miao (Assistant Professor, Director General, University of Macau, Faculty of Health Sciences, Macau Association for Young Scientists)
Erli Lyu (Lecturer, Macao Polytechnic University, Faculty of Applied Science)

• *Session Overview*

The Netherlands' higher education system was highlighted for its leading role in AI, with top-ranked universities and a robust startup ecosystem applying AI in healthcare, analytics, industry, and cybersecurity sectors. The Dutch government's Strategic Action Plan for NL AI and its vision for generative AI were discussed, emphasizing talent development to meet European standards and values. In chemistry, AI's integration with statistical mechanics and molecular simulation was presented as essential for optimizing chemical reactions and processes. AI models were noted for their cost-effectiveness and potential in predicting materials design and development. The session underscored the importance of interpretability and uncertainty quantification in AI outputs. Challenges for young scientists in AI that hinder their growth and productivity were addressed with calls for mentorship, resources, and government support to foster an ethical research environment. The application of AI in cancer diagnosis and treatment was another key topic, focusing on overcoming the challenges posed by the heterogeneity of the tumor microenvironment (TME). The discussion covered intelligent analytical methods of multi-omics and the development of precise diagnosis and treatment models based on gene cluster subclones and cell subgroup analysis. It was shown that an AI-based tumor interpretable image study would provide new ideas and methods for deciphering TME from the perspective of intelligent information analysis. It is of great significance for precision medicine of cancer in clinical practice. Lastly, the interplay between AI and robotics was explored, tracing their historical development and showcasing

how modern AI technologies address previously unsolvable problems in robotics.

• *From the speakers*

Sjoerd Dikkerboom
Dutch higher education and Universities in general are ranked among the best in the world, with a high emphasis on personal development of students. All 12 universities are ranked <250 and several in the top 100 and top 50. The Netherlands is home to 4 out of 10 leading master's Programs in Artificial Intelligence worldwide. Additionally, a number of technical universities are expanding their curriculum to include AI education. The Netherlands offers young entrepreneurs a lot of opportunity to start and grow their business. The AI startup landscape covers a wide array of companies, applying AI in healthcare, analytics, industry and in cybersecurity. Two companies, Cradle.AI and Weaviate were mentioned in 2024 Forbes' AI50. The Dutch government launched a Strategic Action Plan for NL AI in 2019. The primary objective is to bringing knowledge, people and parties together as central point for ai in the Netherlands. In 2024 this followed up with a vision on generative AI. This includes a focus on talent and talent development. To fully utilize the opportunities that generative AI offers, a focus on knowledge and skills is important, developing and retaining AI talent. So, we can develop generative AI that meets European standards and values.

Chao Zhou
Artificial intelligence (AI) has had a profound impact on various fields. However, in the domain of chemistry, AI must collaborate with statistical mechanics and molecular simulation to become a valuable and rational tool. The process of artificial chemical intelligence generally involves three stages: data collection, representation of input information in computational languages, and the description of systems using appropriate models. AI offers several opportunities for chemists, such as real-time optimization of chemical reactions and processes. Trained AI models are also cost-effective compared to empirical ones for predicting materials design and development. An important objective of employing artificial chemical intelligence is to ensure interpretability of the output results, which relies on quantifying individual prediction uncertainties. Recent research focuses on the application of AI in designing synthesis processes and predicting new chemical structures of metal-organic frameworks (MOFs), serving as an illustrative example. Despite the significant potential of AI in research and development, maximizing the benefits of this tool may require additional time. Young scientists entering the AI field currently face several bottlenecks that can hinder their growth and productivity. To overcome challenges, government support, along with institutions and senior researchers, can provide mentorship, resources, collaborations, and an environment valuing ethical research. Government funding and ongoing education help young researchers remain up-to-date and adapt to emerging challenges and technologies in the field. Together, these collaborative efforts can create a nurturing ecosystem that empowers young scientists and fosters advancements in artificial intelligence.

Kai Miao
Cancer has become a major disease endangering human health. With the development of artificial intelligence technology, how to carry out intelligent precise diagnosis and treatment for cancer is a hot and difficult issue worldwide. A large number of studies have shown that the main obstacle and challenges affecting the accuracy of cancer diagnosis and treatment is due to the high heterogeneity of the tumor microenvironment (TME). Our work aims to improve the level of precise diagnosis and treatment of cancers and carry out research on intelligent analytical methods of multi-omics with a focus on the key issue of TME heterogeneity. The intelligent analysis of gene cluster subclones and cell subgroups of TME heterogeneity will be performed by the analysis of bulk transcriptome and single-cell transcriptome data reflecting different functional characteristics of tumors. The molecular mechanism of TME heterogeneity will be explored by establishing key experimental technologies and the intelligent analysis of data such as single cell/space transcriptomes. The relationship map between the interpretable image phenotypes and the gene expression, molecular typing, therapeutic efficacy, and prognosis will be built based on the analysis of radiomics data driven by the heterogeneity of the microenvironment and molecular mechanism. Intelligent precise diagnosis and treatment models with biological function interpretability will be finally established. AI-based tumor interpretable image study will provide new ideas and methods for deciphering TME from the perspective of intelligent information analysis and is of great significance for precision medicine of cancer in clinical practice.

Erli Lyu
Artificial intelligence and Robotics are generally considered two sides of a coin. However, from the perspective of a researcher, they are more like the two ropes that are twisted together. In this talk we will trace back to the Zhou dynasty to review the earliest descriptions of automata and revisit the famous Dartmouth workshop where the term artificial intelligence was first proposed. Followed by a discussion of the development and current achievements of these two fields. Then this talk will illustrate how modern AI technologies can be adopted in the robotics field to solve the problems that are previously considered difficult to solve in robotics.

THE POTENTIAL OF AI IN EDUCATIONAL PRACTICE AND AI-BASED LEARNING ENVIRONMENTS

Chair
Zhai Xuesong (Senior Researcher, College of Education, Zhejiang University, China)

Speakers
Yi Dai (Assistant Professor of the School of Education, City University of Macau), Tinghui Wu (master student majoring in Educational Technology at the College of Education, Zhejiang University)
Lijie Zhang (master's candidate in Educational Technology at Zhejiang University),
Shuang Ji (undergraduate student, Nanjing Normal University)
Xiao-guang Yue (Co-Founder and Foundation Fellow of International Engineering and Technology Institute (FFIETI))

• *Session Overview*

The session focused on research that explores how

to fully harness the potential of AI in educational theory and practice, including the application of advanced AI technology, AI-based learning analysis, and AI literacy building. The development of AI, particularly generative AI models like ChatGPT, has had an irreversible impact on education, resulting in significant transformations in traditional teaching processes and instructional behavior analysis. Technology integration in education, particularly through Technology-Supported Classrooms (TSCs), has shown promise in enhancing Teachers' Professional Development (TPD) and fostering educational innovation. The session showcased research investigating teachers' behaviour and factors influencing sustainable TPD across Multimedia, Smart, and Collaborative Classrooms in Guangdong Province, China. Using a Teacher's Behaviour Observation framework, the study identified behavioral sequences and highlighted the effectiveness of TSCs in supporting long-term professional growth and creativity, thereby mitigating burnout. The session further explored the research integrating the metaverse and eye-tracking technology to enhance online learning performance aligned with SDG4 and SDG10. Using the TPACK and social interaction theories, a virtual teaching platform is developed for STEM education, emphasizing behavioral data tracking and attention management through eye-tracking. The aim is to improve learning outcomes and mitigate Computer Vision Syndrome, promoting effective metaverse design for enhanced educational experiences. Finally, the session featured a study exploring enhancing collaborative problem-solving skills through human-computer interaction, focusing on GAI. It highlighted the evolution from traditional models to GAI-enabled methods like reverse engineering, beneficial in engineering education. The study aims to assess how this pedagogy supports collaborative problem-solving with GAI, offering insights for AI-assisted education's application and efficacy.

- ***From the speakers***

Yi Dai

Technology integration into education has long shown pivotal potential in supporting the sustainability of Teachers' Professional Development (TPD) and fostering educational innovation through Technology-Supported Classrooms (TSCs) that blend technological tools and traditional teaching method. Nevertheless, macro-research on teachers of TPD still requires more scholarly attention. Notably, this research focused on examining the behaviour of teachers in modern classrooms and the key factors that enhance the overall success of sustainable TPD. Additionally, it leveraged the sustainability of TPD to enhance professional development and decrease fatigue, focusing on three TSCs types: Multimedia Classrooms (MC), Smart Classrooms (SC), and Collaborative Classrooms (CC), based on two years of data from Guangdong Province, China. Employing a Teacher's Behaviour Observation (TBO) framework that includes Scientometric Approach (SA), Lag Sequential Analysis (LSA), and Motif Analysis (MA), the research revealed behavioral sequences and to uncover the advantages and significance hidden in TPD. The findings emphasize the effectiveness of TSCs in offering a deep and comprehensive understanding of teaching behaviors. This understanding contributes significantly to the exceptional sustainability of TPD throughout various stages of a teacher's career. The insights gained offer valuable guidance for educators to mitigate burnout and invigorate creativity in sustainable education.

Tinghui Wu

The Sustainable Development Goals (SDGs) proposed by United Nations provide guiding principles for the long-term development of education, particularly SDG4 for quality education and SDG10 for educational equity. With the development of the metaverse and eye-tracking technology, this research aims to explore how the integration of these two can enhance learners' online learning performance. Based on the TPACK theory and the social interaction theory, our research team has developed an immersive, interactive, and virtual metaverse teaching platform. This platform, with a focus on comprehensive educational behavioral data tracking, includes general scenes for exploration and social correlations and subject-oriented scenes for STEM education. Furthermore, as the increased screen time has led to the emergence of Computer Vision Syndrome (CVS), we also introduce eye-tracking technology to identify design elements that attract or distract their attention. Based on this, we can discover effective metaverse manipulations designs to alleviate the pressure of CVS. Finally, with the complementary effects of these two, learners' online learning perceptions and outcomes are expected to be enhanced, which will be testified in the following supporting practical application.

Lijie Zhang

Human-computer collaborative problem-solving ability has become a key high-level skill for future learning and work. However, this ability had not been effectively fostered by the previous human-computer interaction model. The emergence of GAI changed human-computer interaction, making it easier to achieve collaborative problem-solving in complex scenarios. However, there is currently a lack of teaching methods compatible with GAI. Reverse engineering is a concept that starts from the expected product and involves analyzing, deconstructing, and reconstructing solutions. And thus, it highly resembles human-computer collaborative problem-solving based on GAI. It has found widespread application in the field of engineering education. Therefore, it may support the cultivation of new collaborative problem-solving abilities in areas such as programming education.
This study previously constructed a reverse engineering learning system based on GAI. Students can break down, reassemble, and replicate a small game project from a holistic level to a component one. Through interaction with the digital tutor, students gradually acquire knowledge, skills, and abilities in programming while implementing the project. This research aims to explore whether and how reverse engineering pedagogy facilitates learners' collaboration with GAI in tackling complex coding problems, in order to strengthen the value of reverse engineering in AI assisted education and provide a reference for applying GAI in the field of education.

BUILDING CAPACITY WITH GENERATIVE AI

Chair

Fernando Buarque (Chair, Senior Associate Professor of Computing (AI), School of Engineering, University of Pernambuco, Brazil)

Speakers

Avishan Bodjnoud (Chief, Information Management Officer United Nations, Departments of Political

and Peacebuilding Affairs and Peace Operations (DPPA-DPO))
Jesse Lastunen (Research Associate, United Nations University World Institute for Development Economics Research (UNU-WIDER))
Yan Bai (Assistant Professor in the Department of Strategy, Leadership and People at EADA Business School (Barcelona, Spain))
Jie Peng (Master of Public Management at the Hong Kong University of Science and Technology (HKUST))
Siting Xiong (Associate research fellow, Guangming Laboratory),
CHI Cheong Wong (Chief Supervisor Macau Credit and Collection Management Association)
Rita Hai Min Dai (Assistant Professor in Education School of Education | Shanghai Jiao Tong University)

• *Session Overview*

This session presented diverse applications of artificial intelligence (AI) across several domains, showcasing its transformative potential and ethical considerations in various contexts. The first presentation highlighted AI's role in enhancing United Nations peacekeeping operations through generative AI models. These models facilitate advanced training simulations, improve situational awareness, aid in post-conflict reconstruction, and enable multilingual communication - boosting operational efficiency and effectiveness. The session also explored Generative Artificial Intelligence Applications (GAIAs) in economics and social sciences research. It detailed how large language models like GPT-4 enhance ideation, writing, background research, coding, data analysis, and mathematical derivations. Despite their utility, the presentations cautioned about the need for careful oversight due to potential inaccuracies in complex analyses and high-level mathematical work. Moreover, the session examined the role of AI in combating organizational corruption. It revealed that human-AI collaboration in teams could significantly reduce cheating behavior compared to human-only teams. This finding underscore AI's potential to improve ethical decision-making in organizational settings, offering new insights for mitigating corrupt practices. Lastly, the session discussed the integration of ChatGPT in higher education for language learning and teaching. It explored ChatGPT's capabilities in creating adaptive and interactive learning environments while addressing ethical concerns and academic integrity issues. Interviews with language instructors in China provided practical insights into the challenges and opportunities of incorporating AI in educational settings. Overall, the session underscored AI's broad applications across peacekeeping, research, organizational ethics, and education, highlighting its transformative impact and the ongoing ethical considerations accompanying its integration into various fields.

• *From the speakers*

Avishan Bodjnoud

The presentation explores the transformative potential of generative AI in augmenting United Nations peacekeeping operations. Generative AI, characterized by its ability to synthesize and analyze large datasets, can significantly enhance the efficiency and effectiveness of peacekeeping missions. The core applications discussed include advanced training simulations, enhanced situational awareness and analysis, post-conflict reconstruction efforts, and facilitation of communication in multilingual contexts. Training simulations enriched by generative AI provide peacekeepers with realistic, varied scenarios, enabling them to develop critical skills and adapt to complex environments. For intelligence operations, generative AI's data synthesis from diverse sources like satellite imagery and social media offers comprehensive situational awareness, vital for strategic planning and threat mitigation. In post-conflict scenarios, generative AI aids in resource allocation and strategy evaluation, ensuring that reconstruction efforts are impactful and targeted. Additionally, its role in overcoming language barriers through real-time translation promotes effective communication and reconciliation efforts.

Jesse Lastunen

This presentation explores how Generative Artificial Intelligence Applications (GAIAs) can reshape the day-to-day work of researchers in economics and other social sciences. Specifically, it examines how generative AI, especially Large Language Models like GPT-4, can improve various aspects of researchers' work. The presentation is structured around six key domains where generative AI can have a significant impact: ideation and feedback, writing, background research, coding, data analysis, and mathematical derivations. LLMs excel in providing diverse ideas and unbiased critiques, enhancing the process of ideation and feedback. For writing, AI assists in generating coherent text, improving grammar, and adding context, although outputs need careful review. In background research, LLMs help streamline tasks such as literature searches and reviews, though accuracy verification remains crucial. Coding is another domain where LLMs show promise, helping write, edit, and debug code in various programming languages. AI applications also aid in data analysis by formatting, extracting, and classifying data, and producing visual representations. However, as above, complex analyses generally require thorough user oversight to ensure accuracy. Lastly, generative AI can be used for mathematical derivations by setting up models and solving basic equations, supporting educational efforts, among other benefits. Despite its capabilities, these tools are not yet reliable for high-level mathematical work, necessitating careful user supervision. Overall, the presentation highlights how GAIAs can improve productivity, enhance research quality, and allow researchers to focus more on critical thinking and their core competencies while addressing the potential risks and limitations associated with these tools.

Yan Bai

Across the globe, corrupt behavior in organizations generates huge losses for society. Corruption has a negative impact on economic and social development and the achievement of SDGs. There is a renewed motivation to achieve a better understanding of corrupt behavior in society and organizations and, most importantly, a remedy against it. Academic research has demonstrated the collaborative roots of corruption. That is, people cheat in social interaction and collaboration (Weisel and Shalvi 2015) and bilateral human interaction erodes moral value (Falk and Szech 2013). However, emerging technologies such as Artificial Intelligence (AI) have expanded the possibility and availability of a new participant of social interaction and collaboration with humans: AI agents. Technological advancement has made it possible for AI agents to work together with humans in a collaborative setting. Human-AI collaboration occurs when humans

and AI work together in an interactive process, using shared rules, to act or decide on a variety of tasks, such as joint decision-making, problem solving, medical diagnosis etc. However, little is known about how human-AI interaction in a collaborative setting affects an individual's ethical decision-making. Our research aims to harness the full potential of AI by investigating how organizations can use AI effectively in reducing cheating behavior at work and how human-AI teams can help fight again organizational corruption. In this work, we study how cheating is influenced by a type of collaborator at work: human versus Artificially Intelligent (AI) agent. Specifically, we evaluate cheating behavior by a person, who interacts with another human or an AI agent in a collaborative team setting. We conducted behavioral experiments in both lab and online setting to investigate our research question (N=1796, 32940 observations). We found that people cheat more when they interact with another human in comparison with an AI in a team setting, because people infer that a human teammate is more inclined to cooperate in cheating than an AI teammate. The results hold regardless of whether the AI is operationalized as a simple algorithm, a human embodiment, or can resemble human appearance and behavior. We used a highly realistic AI which was created by researchers from a leading tech company developing AI. Additionally, we show our findings are counterintuitive to the general public and managers who are unaware of the differences between human-AI team versus human-human team regarding reducing corrupt behavior in organizations. Our research also speaks to managerial practice. The Human-AI team becomes a new workforce in the organization. We focus on the combination of human and AI and show how people make ethical decisions when interacting with AI in a team. Our research demonstrates that, when used in the right way, combining human and AI workforce can help to tackle corrupt behavior and generate a positive social impact.

Rita Hai Min Dai

This study delves into the evolving discourse surrounding ChatGPT, a cutting-edge language model, and its growing impact on higher education. ChatGPT has a powerful ability to comprehend natural languages and generate human-like text to address queries and provide solutions across a wide range of subjects. The present study explores how ChatGPT can create adaptive and real-time interactive environments for language learning, teaching and assessments. However, amidst the promises of artificial intelligence (AI), we also critically navigate the ethical considerations, academic integrity concerns, and challenges associated with integrating ChatGPT into language education. Furthermore, the present research conducts in-depth interviews with 8 language instructors in China to explore their perceptions and attitudes regarding the incorporation of ChatGPT for teaching purposes. By examining their perspectives, the study seeks to provide valuable insights into the practical implications and challenges faced on the ground.

INTEGRATING DATA TO ENSURE INCLUSIVE EDUCATION OF CLIMATE CHANGE DISPLACED POPULATION

Chair

Jonghwi Park (Chair, Head of Innovation and Education, Academic Programme Officer, UNU-IAS)

Speakers

Mwizerwa Myriam Abiyer (Head of Office IOM – UN Migration - Hong Kong SAR, China Sub-Office)
Pierre Chapelet (Senior Programme Officer, UNESCO Paris)
Serge Stinckwich (Head of Research, UNU Macau)

- ***Session Overview***

Global records indicate that in 2020 alone, weather-related disasters displaced over 30 million individuals, outnumbering conflict-related displacement by three times. Climate change displacement has emerged as a serious threat to achieving inclusive and equitable education and lifelong learning for all, set out by SDG4. A study (UNU-IAS and UNESCO, 2023) revealed that drop-out rates of children from the climate change displaced families are increasingly high and there is an urgent need for data-informed planning for education provision in the context of climate change. This session explored issues and opportunities that AI can offer from diverse sectors in enhancing the data-informed decision to ensure undisrupted, inclusive and equitable education for migrants and displaced children in the context of climate change. The session featured experts from intersectoral areas, including education policy, AI-generated data, human mobility, and climate change. It discussed potential policy recommendations, including shifting from census-based education data to transactional student data, exploring innovative data, e.g. GIS data, disaster data and Big Data to project potential in/outflux of learner displacement, and creating a simulation to support education planning reflecting climate change impact, human mobilities and required resources for inclusive education. The session concluded with inter-sectoral collaboration opportunities to put the discussion outputs into practice.

DEVELOPING A UNESCO TOOLKIT FOR OPEN SCIENCE POLICY FOR DATA AND AI IN TIMES OF CRISIS

Chair

Francis P. Crawley (Chair/speaker, Chairman, CODATA International Data Policy Committee (IDPC))

Speakers

Perihan Elif Ekmekci (Professor, former Head of European Union Department of Ministry of Health, TOBB University, Faculty of Medicine)
Zhenzhi Zhu (Fellow with the CODATA International Data Policy Committee (IDPC); Co-chair of CODATA Connect)
Virginia Murray (Head of the Global Disaster Risk Reduction, Public Health England)
Ana Persic (Programme Specialist for Science Technology and Innovation Policies and Open Science, UNESCO)

- ***Session Overview***

The session explored how open science and crisis management underscore the foundational principles and practical applications driving global resilience in crises. Open science, rooted in values of inclusiveness and collaboration, emphasizes the transparent sharing of scientific knowledge, data, and methodologies. In crisis situations, such

as conflicts or natural disasters, these principles are crucial for ensuring reproducibility, fairness, and ethical data sharing practices. Recognizing a global need for standardized guidelines in crisis data sharing, UNESCO and CODATA are spearheading the development of a toolkit for open science policies, aimed at enhancing preparedness and response strategies worldwide. The session also highlighted advancements in climate science, detailing the profound impacts of human-induced global warming on ecosystems and communities. Discussions focused on the critical thresholds of temperature rise, such as the potential melting of West Antarctica and Greenland, and heightened risks like increased fire frequency in Europe. Emphasizing the urgency of effective mitigation measures, the session highlighted collaborative efforts with COP to support vulnerable small island nations facing sea level rise. It was noted that AI emerged as a pivotal tool in combating climate change, contributing to scientific modeling, environmental predictions, and innovative responses. AI applications include decarbonization strategies and drone-based monitoring in Brazil, showcasing its potential to revolutionize climate resilience efforts globally. Lastly, the session emphasized the ethical imperative of fairness, responsibility, and evidence-based practices in crisis management and climate action. By promoting transparency and inclusivity, stakeholders can collectively advance global resilience and sustainability goals, ensuring equitable outcomes for all affected by environmental and societal challenges.

AI MEDIA, COMMUNICATION, AND EDUCATION

Chair

Nimmi Rangaswamy (Professor, International Institute of Information Technology Hyderabad Telangana, India)

Speakers

Chu Chu (Ph.D. Candidate, Journalism School, Fudan University)
Fernando Buarque (Senior Associate Professor of Computing (AI), School of Engineering, University of Pernambuco, Brazil)
Min Yang (Researcher at the United Nations University Institute in Macau)
Pia Faustino (Director for Social Impact and Sustainability Thinking Machines Data Science)

• *Session Overview*

The session discussed algorithmic distribution's profound impact and algorithmic technologies' pervasive influence on modern society, drawing parallels with Adorno and Horkheimer's culture industry theory. Algorithmic distribution, powered by AI and big data, shapes information dissemination and consumer behavior on an unprecedented scale, often surreptitiously exerting control over users through personalized recommendations and targeted content. The presentation underscored the dual-edged nature of algorithmic power, while it offers convenience and customization, it also poses ethical challenges concerning autonomy and manipulation. Addressing the pressing issue of fake news, the session highlighted innovative approaches using ensemble algorithms to combat misinformation on social media. By integrating multiple detection techniques like natural language processing and sentiment analysis, these algorithms aim to enhance accuracy in identifying deceptive content, thereby mitigating its harmful societal impacts. The research showcased promising results, demonstrating that ensemble models outperformed standalone RoBERTa models, setting a precedent for future fake news detection technology advancements. The session envisioned a future where Generative AI (GenAI) plays a pivotal role in realizing SDGs. Emphasizing the need for global collaboration and robust policy frameworks, speakers advocated for harnessing GenAI's capabilities in accelerating SDG monitoring and achieving inclusive, sustainable outcomes. By leveraging GenAI for data analysis and decision-making, organizations can streamline processes, improve accuracy in monitoring SDG progress, and navigate challenges exacerbated by global crises like COVID-19. Overall, the session underscored the transformative potential of AI in both cultural industries and societal challenges, urging stakeholders to advocate its deployment responsibly while maximizing its benefits for collective progress and resilience.

• *From the speakers*

Chu Chu

Algorithmic distribution refers to an information dissemination system rooted in big data and artificial intelligence technologies, which aligns information with users through algorithmic models. In the landscape dominated by algorithmic power, the collusion of technology and capital increasingly fosters the covert expansion of algorithmic authority. The Frankfurt School representatives Adorno and Horkheimer introduced the theory of the culture industry at the onset of the twentieth century, scrutinizing the control exerted by media and cultural commodities over individuals in the age of mass communication. Today, algorithmic technology has revolutionized the cultural industry, engendering a populace heavily reliant on the myriad conveniences it offers, often oblivious to its controlling influence and ensnared in hedonistic indulgences. In the context of contemporary technological advancements, understanding how the culture industry harnesses algorithms to shape human behavior becomes imperative. This presentation, drawing from Adorno and Horkheimer's culture industry theory, endeavors to critically dissect the operational dynamics of algorithmic technology while scrutinizing and reflecting on the industrialized mode of information dissemination. By leveraging big data and annotation for personalized recommendations, contemporary culture industry products epitomize large-scale customization. Through the cultivation of artificial needs and the implementation of participatory control, media platforms furnish users with compensatory satisfaction, ultimately seeking to 'tame' their behavior. Synthesizing prevailing phenomena, this presentation delves into effective strategies to resist algorithms and proposes frameworks for governing artificial intelligence in the future.

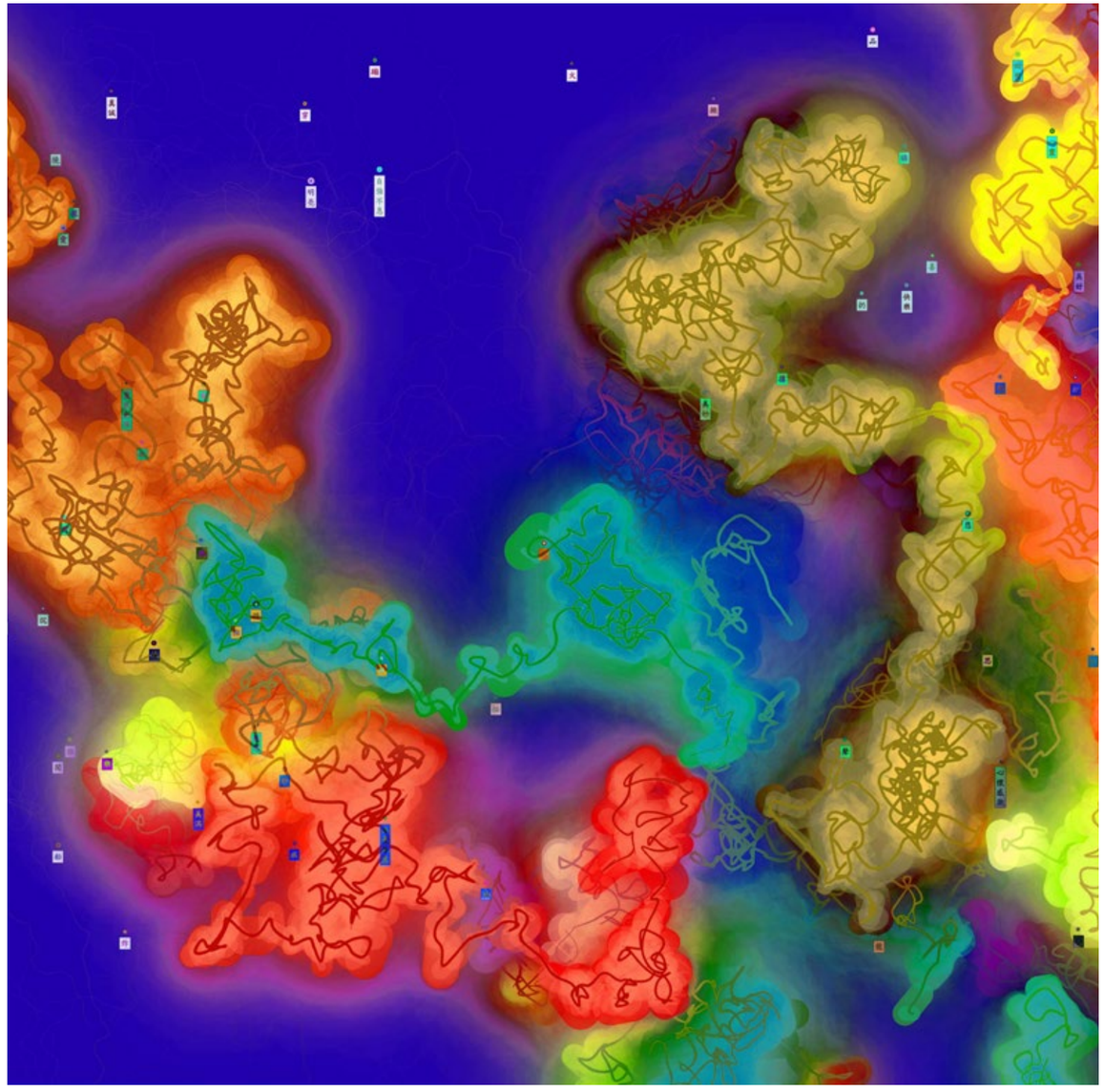
Fernando Buarque

The rise of fake news on social media is a significant problem, adversely affecting society, including elections and public health information. Emotions, political beliefs, and reliance on questionable sources are factors that contribute to the sharing of fake news. To combat this, the project proposes an ensemble algorithm

that combines various detection techniques, enhancing accuracy. It explores natural language processing, sentiment analysis, and other tools, aiming to create more comprehensible and effective solutions to minimize the impact of fake news on society. The core focus of this research was to develop a fake news detection model that integrates both objective elements and subjective factors such as sentiment and irony analysis. The goal was to create a system that not only comprehends the structural features of the language but also interprets the expressive nuances and emotional cues that may indicate deceptive intent behind the text. The outcomes indicate that the performance of the ensemble model slightly surpassed that of the standalone RoBERTa model in text classification, suggesting that a combination of multiple features can lead to more effective detection. This positive result from the ensemble model paves the way for further research and practical applications, enhancing the impact of the study on the improvement of fake news detection tools and significantly contributing to a better-informed society. So far, no Large Language Models have been used, which could be seen as an additional component to be added and explored.

Pia Faustino

Envision a future where GenAI is a powerful ally in our collective pursuit of sustainable development. Learn to navigate and effectively leverage GenAI, ensuring alignment with the SDGs. Foster global collaboration to develop robust policy frameworks that overcome challenges. Learn to use GenAI as a tool to pave the way for a more inclusive, sustainable, and livable world. COVID-19's effects on the world have been extensive, impeding years-long progress on several Sustainable Development Goals (SDGs) such as gender parity and poverty alleviation. With much less time to not only recover but surpass SDG pre-pandemic milestones, accurate SDG monitoring has never been more important. Traditional SDG monitoring is tedious and complex; it relies heavily on self-reported data, which is prone to inaccuracies due to a lack of systemic processes in collection, analysis, and human subjectivity. In this talk, we'll share how mission-oriented organizations can leverage GenAI to both speed up and improve the accuracy of data input for better SDG monitoring. GenAI is an exceptional tool for quickly scanning, interpreting, and summarizing large volumes of text. Discover how LLMs can help organizations and enterprises brainstorm innovative ideas and perform intelligent, lightning-fast information retrieval to optimize lengthy, complex research and analyses.



AI GOVERNANCE FOR THE FUTURE

A GENDER EQUALITY PERSPECTIVE ON RESPONSIBLE AI

Chair
Eleonore Fournier-Tombs (Chair/speaker, Head of Anticipatory Action and Innovation, UNU CPR)

Speakers
Atsuko Okuda (Regional Director of Asia and the Pacific ITU)
Jaimee Stuart (Senior Researcher, Team Lead, UNU Macau)
Gaelle Demolis (Governance, Peace and Security Policy and Programme Specialist UN Women Regional Office Asia and the Pacific)
Jonghwi Park (Head of Innovation and Education, Academic Programme Officer, UNU-IAS)

• *Session Overview*

Over the last few years, AI technologies have grown in adoption globally, and in parallel, concerns about gender risks. In fact, AI technologies tend to pose particular risks to demographic groups that have historically been marginalised. For women, these risks have included discrimination – where AI tools have higher error rates for women than for men; stereotyping – where AI tools create content that perpetrate norms about women that are based on their sexualization or inferiority; exclusion – where women are not part of the design, development or decision-making around the AI tools; and insecurity – where AI tools decrease the security of women. On the other hand, it is important to note the immense contributions of women in the AI space, as many women have led the development of new types of AI, have spearheaded its governance, and have conducted important research impacting the space. For all its risks, AI also can be promising for the socioeconomic empowerment of women, by developing new labour markets, supporting women's security and other areas impacting gender equality. What is still lacking, however, is the mainstreaming of women's rights and gender equality in AI development and governance. This panel hopes to address this gap by discussing the critical risks and opportunities of AI from a gender perspective and charting actionable recommendations.

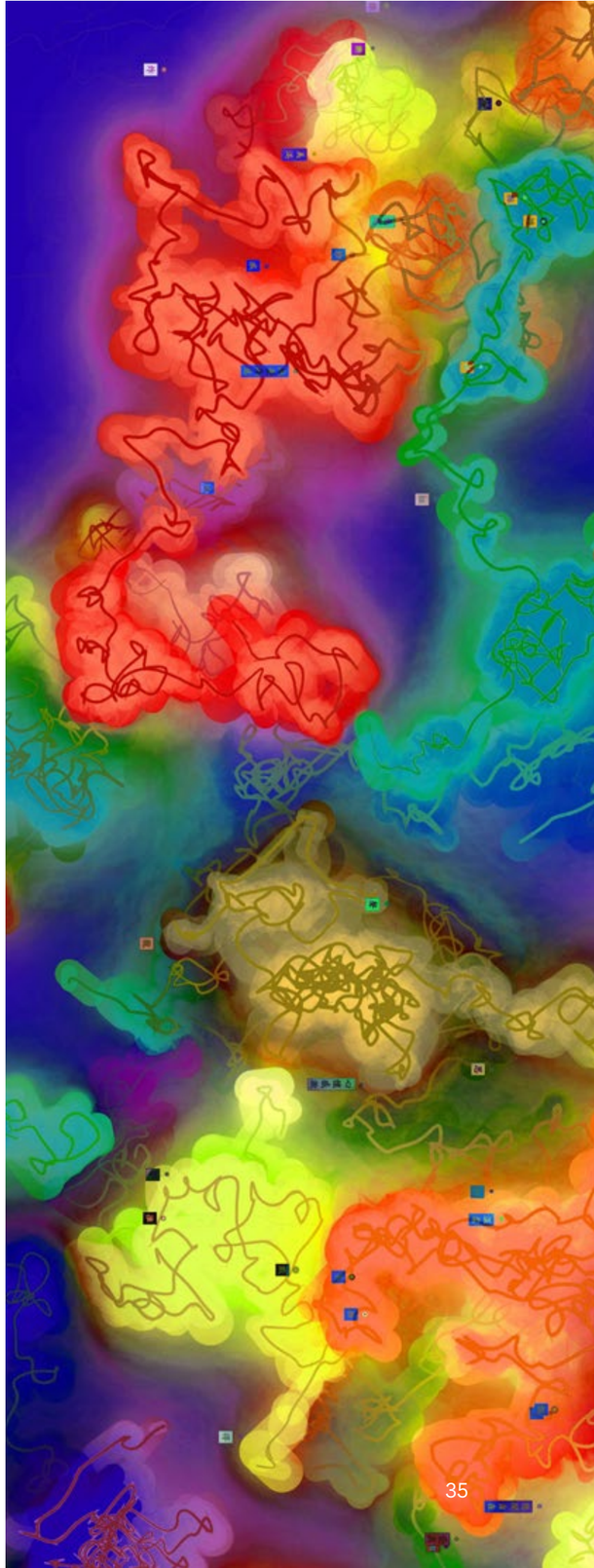
GEN AI GOVERNANCE AND LAW IN THE ASIA-PACIFIC REGION

Chair
Xingzhong Yu (Chair, Professor, University of Macau)

Speakers
Mayu Terada (Professor, Hitotsubashi University)
James Ong (Founder & Managing Director, Artificial Intelligence International Institute (AIII) and Adjunct Professor, Singapore University of Technology & Design (SUTD) & AI Mega Centre)
Dan Linna (Senior Lecturer & Director of Law and Technology Initiatives, Northwestern
Guanjun Wu (Distinguished Professor, Dean of the School of Politics and International Relations, Director of the Institute of Singularity Studies, East China Normal University)

• *Session Overview*

This session reviewed the mechanism design for risk management of generative artificial intelligence in the Asia-Pacific region from two dimensions: regulation of AI and regulation for AI. The discussion began with an overview of China's AI governance approach, characterized by a hierarchical legal system, an experimental regulatory stance, and an emphasis on security concerns. Despite the absence of a comprehensive AI law, China's proactive regulatory measures and engagement with young scholars and institutions demonstrate a concerted effort to shape a robust AI governance strategy. The session then outlined Japan's AI regulatory landscape, emphasizing the absence of dedicated AI laws and the reliance on guidelines and research initiatives for governance. The Digital Agency's role in coordinating digital reforms and Japan's human-centric AI principles—which prioritize human rights, transparency, fairness, safety, and security—were also discussed. Japan's agile governance approach balances regulatory oversight with fostering innovation and highlights the country's commitment to adaptive AI regulation informed by international best practices. Furthermore, the session



highlighted ASEAN's diverse AI governance and development, emphasizing regional collaboration, ethical oversight, and sustainable development. Singapore's proactive initiatives, such as the Governable AI concept and the Model AI Governance Framework, were showcased as examples of leadership in the region. The ASEAN AI strategy prioritizes collective responsibility, aiming for AI technologies to benefit society and promote inclusive growth. Finally, the session stressed the need for robust AI investments in legal and governmental systems to enhance justice accessibility and streamline processes. It underscored the importance of proactive AI governance, swift action, consensus-building, and collaboration on regulatory frameworks to address AI's complex challenges and technological advancements.

• *From the speakers*

James Ong
The evolution of AI governance and development is marked by technological advancements, regulatory frameworks, and ethical considerations. Globally, nations have diverse approaches to harnessing AI's potential while addressing its societal impacts. The ASEAN region, with its varied economies and cultures, presents a unique landscape for AI development and governance. ASEAN countries have made significant strides in AI adoption and regulatory frameworks, with a focus on balancing innovation and ethical oversight. Regional collaborations and individual country initiatives illustrate the growing commitment to AI governance. Singapore stands out in the ASEAN AI landscape, showcasing initiatives such as the Governable AI concept debated at 2022 SWITCH (Singapore Week of Innovation and Technology), the Model AI Governance Framework, the AI Verify Foundation, and the AI Ethics and Governance Body of Knowledge by the Singapore Computer Society (SCS). Platforms like the AIMX 2023 world summit and WAIC China-Singapore AI Forum from 2021 to 2023 further highlight Singapore's proactive stance in fostering a sustainable AI ecosystem. The ASEAN AI strategy must prioritize the concept of "Why Sustainable AI is a Collective Responsibility," emphasizing regional cooperation, shared ethical standards, and sustainable development goals. By adopting this model, ASEAN can ensure that AI technologies are developed and deployed to benefit society, mitigate risks, and promote inclusive growth. In conclusion, ASEAN has a pivotal role in the global AI narrative. By championing a collective, ethical, and sustainable AI strategy, the region can contribute significantly to "AI for Humanity," ensuring AI advancements align with societal well-being and global sustainability.

FRAMEWORKS OF AI GOVERNANCE

Chair
Zhengkun Hu (Director for AI Ethics and Governance, SenseTime, China),

Speakers
Pankaj Pandey (Research Scientist at the Center for Cyber and Information Security, Norwegian University of Science and Technology, Campus - Gjovik, Norway)
Craig Wing (International Speaker, Futures strategy, scenario planning, EdgeofNowhere host, PhD Candidate)
Anuujin Sanjaajamts (Expert of E-Government Development, Communications and lnformation Technology Authority (CITA), Government of Mongolia)

• *Session Overview*

The conference session featured insightful discussions on the transformative potential of artificial intelligence (AI) across diverse domains, emphasizing its role in shaping future strategies and public policy. Firstly, ENFIELD outlined its ambitious initiative to establish a European Center of Excellence focused on Adaptive, Green, Human-Centric, and Trustworthy AI. This initiative aims to elevate AI research in sectors such as healthcare, energy, manufacturing, and space by fostering collaboration among 30 consortium members from 18 countries. Educational activities like summer schools and hackathons are also planned to engage and sustain the AI community across Europe. Secondly, the WTF framework introduced a novel synthesis integrating Rumsfeld's "unknown unknowns" paradigm and Johari's window to categorize potential futures influenced by AI. This framework provides a structured approach to analyze AI's implications on governance, regulation, and compliance (GRC), spanning known knowns, known unknowns, unknown knowns, and unknown unknowns. It underscores the importance of preparing for unpredictable disruptions while leveraging AI's potential for strategic planning in both public and private sectors. Lastly, the research on AI's impact on public policy highlighted the challenges and opportunities in adopting AI technologies within governmental frameworks. It emphasized the need for ethical considerations, transparency, accountability, fairness, and data management in AI policy formulation. The study aims to assess existing national AI strategies across different dimensions to inform future policies that maximize public value and mitigate potential risks. Together, these presentations underscored AI's pervasive influence on socio-economic development, innovation, and governance, offering strategic frameworks and initiatives to harness its full potential while navigating ethical and practical challenges.

• *From the speakers*

Pankaj Pandey
ENFIELD is set to establish a distinctive European Center of Excellence focused on advancing fundamental research in Adaptive, Green, Human-Centric, and Trustworthy AI. These pillars represent novel, strategic elements crucial for developing, deploying, and accepting AI in Europe. The initiative seeks to elevate research within key sectors like healthcare, energy, manufacturing, and space by attracting top talents, technologies, and resources from leading European research and industry entities. ENFIELD aims to strengthen the EU's competitive position in AI by conducting high-level research aligned with industry challenges, generating significant socio-economic impact for European citizens and businesses. The project envisions a dynamic European AI network comprising 30 consortium members from 18 countries, including leading educational and research institutions, large-scale businesses, SMEs, and public sector representatives. This collaborative effort will collectively tackle critical issues at the forefront of research and innovation within the realm of European AI. ENFIELD intends to deliver impactful outcomes, including over 75 unique AI solutions (algorithms, methods,

simulations, services, datasets, and prototypes), 180 scientifically influential publications, and 200 peer-reviewed presentations. Additionally, four strategic documents, namely the Common Research Roadmap and Vision, the dynamic Safety and Security Risk Assessment Framework, the White Paper, and the Gender and Ethics Framework, will be produced. ENFIELD plans to support more than 76 individual researchers and 18 small-scale projects through Open Calls, facilitating exchange and innovation. The initiative will also conduct education and training activities, such as summer schools and hackathons, alongside well-designed outreach methods to enhance community engagement, expansion, and sustainability for the ENFIELD project.

Craig Wing

In the dynamic landscape of artificial intelligence (AI) and its profound influence on capacity building, organizations face the challenge of crafting future strategies that transcend traditional, data-centric approaches. This proposed talk introduces the groundbreaking Wings Theoretical Futures (WTF) framework, a novel synthesis ingeniously combining Rumsfeld's "unknown unknowns" paradigm (Rumsfeld, 2002), and Johari's window (Luft, 1961:6-7). The WTF framework, designed to categorize potential futures into four distinct quadrants—known knowns, known unknowns, unknown knowns, and unknown unknowns—provides an intricate lens through which the multifaceted dimensions of AI's role in shaping these scenarios are scrutinized. WTF offers a rigorous examination of the nuanced dynamics of AI integration and its implications for governance, regulation and compliance (GRC) •Quadrant One (known knowns) represents futures where organizations possess a high level of probability, enabling them to model expected future conditions. Complexity is low, and historical forecasts, such as population growth modelling, provide accurate predictions. In the context of AI, this quadrant aligns with trends analysis and known drivers. Organizations anchored in this quadrant may experience a sense of confidence based on past successes but risk fragility when faced with unexpected disruptions. •Quadrant Two (known unknowns) acknowledges externalities organizations do not fully comprehend but recognize their potential impact. This quadrant parallels Johari's "hidden window," and organizations operating here seek to understand disruptive forces, such as the impact of the Fourth Industrial Revolution (4IR). Organizations grapple for governance in this expected future as there is no precedent. •Quadrant Three (unknown knowns) highlights organizations aware of potential externalities but dismissive of their impact on the operating model. These "blind spots" may result from underestimation or deliberate ignorance. For example, while deepfakes may be an emergent danger, the role of spam (arguably a prelude to deepfakes) is yet to be fully handled. •Quadrant Four (unknown unknowns) represents a future where organizations have no understanding of awaiting externalities. This realm, full of unthought-out black swans and wild cards, presents high variability and unpredictability. Organizations operating with a mindset geared for known futures would be exceptionally vulnerable. A core emphasis within this academic exploration lies in the profound impact of AI on future scenarios, particularly in capacitating GRC. The WTF framework serves as more than just a theoretical construct; it is a robust academic tool that guides researchers in refining analytical instruments and methodologies. By focusing on the unique challenges and opportunities presented by AI, the framework enriches scholarly discourse and research within the broader context GRC. This innovative model represents a significant contribution to the academic body of knowledge, offering a strategic lens for investigating the intersection of AI and human capability. As scholars delve into the intricacies of this evolving field, the WTF framework provides a comprehensive and structured approach to future thinking, promising to shape and inform academic discourse on the transformative role of GRC for AI in the future.

Anuujin Sanjaajamts

Artificial Intelligence (AI) as a general-purpose technology will greatly impact various socio-economic elements and create new opportunities for continuous innovation. Nowadays, AI advancement has attracted both public and private sector organizations worldwide. While the private sector has made extensive progress in developing AI and digital transformation strategies, the public sector cannot directly adopt these practices. One could claim that most AI models are based on a single agent with single goals; thus, it is a challenge to bring AI into the policy context because policymaking is inherently about multiple and conflicting goals. Adopting new technologies in the public sector demands tremendous focus on maximizing the public value, which is a complex compared to maximizing shareholders' value. In addition, managers have very little knowledge of using AI in their operations. Therefore, countries worldwide face a new challenge in policy formulation to avoid the dark sides of AI and embrace the potential of its technological development for society and businesses. Thus, the purpose of this research is to use the theoretical framework to assess whether AI national strategies have covered the challenges of AI public policy, and to elucidate what is missing. The framework is composed of six dimensions before deploying any solution for public AI use: ethics, transparency and audit, accountability and legal issues, fairness and equity, misuse protection, digital divide, and data deficit. Based on the framework, a comparative study of countries is conducted. In conclusion, this study will discuss theoretical and practical implications for future research and practice.

NATIONAL AI GOVERNANCE

Chair

Sovann EN (Director of Digital Government Transformation Department, Digital Government Committee)

Speakers

Xuechen Chen (Assistant Professor in Politics and International Relations, Northeastern University (London))
Yuting Tan (PhD Candidate, University of Macau, Major: International Business Law and Dispute Resolution)
Sami Farhad (Senior Lecturer of the Global Engagement Program of Zhejiang University, and Advisor to the Alibaba Group)
Binyi Yang (Nanyang Technological University)

• *Session Overview*

The session explored China's distinctive approach to digital governance, challenging simplistic portrayals of centralized control. The evolving landscape includes a complex interplay of

stakeholders—from local governments and state-owned enterprises to private companies and an increasingly rights-conscious public. This nuanced environment shapes China's digital governance into an amalgamation of pragmatic considerations, adapting to rapid advancements like AI and data marketization. Moreover, the session highlighted a contrasting viewpoint from the European Union's Regulatory Sandbox initiative, which balanced AI regulation and innovation. The Sandbox approach, piloted by EU Member States and shared with countries like Norway and Switzerland, emphasizes testing AI technologies under controlled conditions to refine regulatory frameworks. Challenges remain, particularly regarding governance responsibility, real-world testing of AI systems, and alignment with data protection laws. Drawing parallels with Fintech Sandboxes, this initiative seeks to foster AI innovation while safeguarding user privacy and managing risks effectively. Further, the session explored the imperative for inclusive AI governance advocated by the UN High-Level AI Advisory Board, urging countries to build local capacity for ethical AI decision-making. This approach encourages developing countries to shape their technological futures autonomously, considering local socio-political contexts rather than relying solely on externally imposed standards. Lastly, the ASEAN perspective revealed a nuanced approach to AI adoption among member states, balancing American and Chinese technological ecosystems in smart city projects. This strategic engagement underscores ASEAN's agency in navigating AI's developmental potential while mitigating dependency risks. The findings highlighted how market dynamics and independent corporate choices influence AI adoption, challenging simplistic narratives of geopolitical influence.

• *From the speakers*

Xuechen Chen

In contemporary international scholarship, the ethos and structure of digital governance in China are typically depicted in the broad-brush fashion as state-driven, centralized, and top-down, serving the main objectives of maintaining political stabilities and control by the government, as opposed to the European Union's rights-driven model and the United States' market-driven model. Such generalization or stereotype often marginalizes and masks the fast-evolving and responsive mechanisms in play that involve a wide range of stakeholders including local government apparatus, state-owned and private enterprises of different sizes, and the increasingly rights-conscious general public as well as epistemic community. Outside of some of the more constrained fields such as cyber security and digital sovereignty, concerns for overlapping and sometimes conflicting interests of these stakeholders pull the development of policies, law and regulations in different directions, and shape the digital governance structure of China as a multi-level amalgamation of pragmatic considerations, with a notable variety of experimentalism in different parts of the country. Although there has been a growing consensus that China has emerged as a nascent rule-shaper in the sphere of digital governance, the nature and substance of Chinese model, as well as the operationalization of such model in different subfields of digital governance remain largely underexplored. With an aim of contributing to this debate, this research paper will examine the evolution and characteristics of China's approach to govern and regulate artificial intelligence, drawing on interdisciplinary insights and methodological tools from both Political Science and Law. In particular, the paradigm-shifting developments in artificial intelligence and data marketisation and their highlighted exposure to the general public over a very short period of time pose substantive challenges to the Chinese model, as they do of other major jurisdictions. The results have seen not only the responsive promulgation of obligatory regulations and normative guidance at national level, but also innovative and competing approaches by various municipalities and provinces, as well as early efforts of right-defense by individuals. Our paper argues that in leveraging several of the characteristics that have defined the Chinese approach to law and governance over the past few decades, the same model has thus demonstrated impressive adaptability and responsiveness to changes that dominates the landscape of AI governance in the new era. Although far from perfect, the Chinese experience provides valuable food for thoughts for other jurisdictions that can look past the ideological differences which could sometimes dominates the discussion.

Yuting Tan

The rapid development of AI has brought new opportunities but also new challenges to humans. How should regulators balance AI regulation and AI innovation? The Proposal for a Regulation laying down harmonised rules on artificial intelligence (21 April 2021) initiative introduced the AI Regulatory Sandbox (AI Regulatory Sandbox). Currently, the EU is promoting the Regulatory Sandbox project in two ways. One is that EU Member States, such as Spain and France, pilot the Sandbox. Second, there are reciprocal sharing of information on the Sandbox with well-connected countries, such as Norway and Switzerland, which are also piloting the AI Sandbox. Despite the initial consensus on the design of the rules for the Regulatory Sandbox achieved by the legislature, there remain points of disagreement. The controversy is mainly on three aspects: first, which authorities are responsible for setting up and operating the Regulatory Sandbox. The second is the concern over the development, testing and validation of AI systems in the real world. The third is further clarification of rules that intersect with personal data protection. While Fintech Sandboxes are a few years older than AI Sandboxes, the first Regulatory Sandbox was set up by the Financial Conduct Authority (FCA) in the UK in 2016. As Fintech develops, many countries and regions have established their Fintech Regulatory Sandboxes, and the settings of the Sandboxes in each region are different and featured by their characteristics. This paper researches the successful experience of Fintech Regulatory Sandboxes and explores its potential for building and managing AI Regulatory Sandboxes. It analyses the different operation modes, the flexibility of the regulation framework, the cooperation between companies and regulators, as well as the experiences in protecting users' privacy and risk management of Fintech Regulatory Sandboxes in different regions. Combined with the characteristics of AI technology, the paper will propose how to integrate and expand Fintech Regulatory Sandboxes to better accommodate AI innovation and regulation requirements. This paper aims to provide useful insights for building an AI Regulatory Sandbox.

Sami Farhad

As a new and rapidly advancing general purpose technology, the effects of AI will be felt over decades. No one has a clear roadmap, and one of

the fundamental questions is: Who participates in making choices about AI? Currently, most countries appear to be passengers in flight, that is, they are passive recipients of AI produced by others. Investment, design and regulatory decisions – as well as social, cultural and moral norms – of a small number of countries create products and services used by people everywhere. The resulting global data flows contribute to achieving massive scale and rapid iteration, thus providing great convenience and efficiency while simultaneously increasing inequality. The recently issued Interim Report of the UN High-Level AI Advisory Board: Governing AI for Humanity, states as its first Guiding Principle that "AI should be governed inclusively, by and for the benefit of all." The question is how. This paper argues that the heart of AI ethics and governance is for developing countries to build capacity to make their own choices about technology. This requires developing the capacity (1) to analyze the specific characteristics of each technology, and (2) to consider the social and political choices available to allocate economic value relating to the technology. Rather than looking for an externally generated 'perfect' technology solution or authoritative list of ethical standards, developing countries would be well served to begin building capacity to make informed choices best suited for their local conditions.

Binyi Yang

In the global arena, the narrative of artificial intelligence (AI) politics is increasingly dominated by the strategic competition between the United States and China. The rapid advancement of AI, led predominantly by the United States and China, presents a dual narrative of immense development potential and significant geopolitical tension. The existing research is marked by a debate between a realist-inspired 'geopolitical' perspective that views AI as a source of zero-sum conflict closely related to national and economic security and a liberal-influenced 'global AI governance' perspective emphasizing interdependence and cooperative dynamics. Both perspectives, however, largely employ a state-centric focus that oversimplifies the complex interplay between state and corporate actors within the national policy landscape. This presentation challenges the prevailing state-centric analysis by investigating the nuanced approaches of ASEAN countries in selecting AI infrastructure—specifically within the context of smart city projects—that pivot between American and Chinese technological ecosystems, despite broader geopolitical concerns. Through a comparative case study of Indonesia, Malaysia, and Singapore, this study will unravel the multifaceted decision-making processes that underpin ASEAN countries' strategic, economic, and ethical considerations in their engagement with AI superpowers. Indonesia's deployment of Huawei Safe Cities technology alongside American suppliers like IBM exemplifies the hybridization of AI adoption strategies. Similarly, Malaysia's collaboration with Alibaba, amidst the region's diverse responses to AI technology adoption, showcases ASEAN's nuanced balancing act. This examination reveals ASEAN's assertive agency and highlights how these nations strategically leverage AI for their development agendas whilst consciously addressing the risks of dependency on foreign technology. The findings underscore the importance of a multidimensional approach to understanding and supporting AI sustainable development in ASEAN—a region uniquely situated to influence the global AI trajectory. Besides, the implication of this presentation will underscore that the proliferation of either American or Chinese AI solutions in ASEAN countries is not just a manifestation of geopolitical maneuvering but is also driven by market forces and independent corporate choices. As the battle over AI politics intensifies, the intricate relationship between states and the market becomes more apparent, displaying diversity in the reception of American and Chinese tech enterprises across different nations. The conventional interpretation, which frequently attributes these developments to China's alleged global data governance manipulation or digital authoritarianism, obscures the more subtle influences at play which is truly important in understanding the future landscape of AI development among ASEAN countries.

AI GOVERNANCE AND REGULATIONS

Chair

Zheng Liang (Vice Dean, Institute for AI International Governance of Tsinghua University),

Speakers

Ansgar Koene (Global AI Ethics and Regulatory Leader at EY)
Rostam Josef NEUWIRTH (Professor of Law and Head for Department of Global Legal Studies at the University of Macau)
Yik Chan Chin (Associate Professor at the School of Journalism and Communication, Beijing Normal University)

• *Session Overview*

The session addressed critical aspects of global AI governance, emphasizing the need for international cooperation to tackle the challenges of AI regulation. The session highlighted the global concern surrounding AI regulation, pointing out the lack of consensus among countries, leading to regulatory competition. The speakers advocated for transforming this competition into cooperation by building a multidimensional global governance framework involving stakeholders from the public sector, industry, and academia. The session further outlined efforts by policymakers across key jurisdictions and international bodies to encourage the development of ethical and safe AI systems. Despite differing regulatory approaches based on cultural norms and legislative contexts, there are cohesive areas that form the foundation for detailed regulations to mitigate AI's potential harms while enabling economic and social benefits. Another discussion focused on data as a form of knowledge, where the right to data access was highlighted as a human right, with a comparison of data policies between China and Western countries revealing different yet similar interpretations. The session also highlighted the global increase in attention to AI governance. In China, the "People-Centered and AI for Good" philosophy has led to various initiatives promoting responsible AI development. The United States focuses on safety, transparency, and anti-discrimination in AI governance, while the EU emphasizes forming AI standards and certifications. Despite these efforts, global AI governance faces challenges such as policy fragmentation and the widening AI divide. The United Nations (UN), therefore, is expected to be a balancer and guide of global AI governance.

• *From the speakers*

Ansgar Koene

In this talk we will explore the role of Trusted Third Parties for building an effective ecosystem for assessing and communicating the safety, security, trustworthiness and reliability of AI systems, products and services in a connected world where digital services operate across national borders. While diverse cultural approaches to regulation generally and AI regulation, in particular, make it unlikely that the regulatory oversight of AI systems will become fully aligned, transparent reporting by trusted third parties can potentially help to reduce duplication in compliance burdens. Acknowledging that the challenges of Fairness, Equality, Accountability and Transparency of AI systems are socio-technical in nature, the Trusted Third-Party ecosystem for AI system assurance requires a multi-stakeholder engagement combining expertise from industry, certification and accreditation bodies, academia and civil society. Key elements include: 1. The development of technical standards that operationalize the principles and guidelines for responsible AI that have been published by UNESCO, G7, OECD, and others; 2. The establishing of commonly agreed assessment, testing and reporting frameworks to facilitate comparison and support trust in the results of Ai system assessments; 3. The definition of accreditation criteria for certified providers of AI assurance, with clearly defined codes of conduct.

Rostam Josef Neuwirth

The recent years witnessed a global race for the development of emerging technologies commonly referred to as ‘” artificial intelligence” (AI). This race is often said to be led by the People’s Republic of China (PRC) and the United States with the European Union (EU) and other countries trying to catch up. At the same time, the rapid progress in the development of AI has also gradually revealed serious risks and dangers, which are becoming exacerbated by the creative combination of AI with other technologies, such as big data, biometrics, synthetic biology, neurotechnologies or the Internet of Things (IoT) to mention but a few. These dangers were widely recognized by the adoption of the UNESCO Recommendation on the Ethics of AI in November 2021. At the same time, several national legislators have proposed or adopted comprehensive or specific laws governing AI, such as the EU AI Act, the US Executive Order on AI, or China’s rules on Generative AI. It is now that the world is witnessing a global race for the regulation of AI, which ought to be one for the global regulation of AI instead. The reasons for the need for global regulation on AI complementing national legislative acts lies, as the paper argues, primarily in the cross-cutting, cross-border, cross-cultural and all-pervasive nature of AI and related disruptive technologies. These characteristics are also shared by a number of other issues of global concerns as reflected in the Sustainable Development Goals (SDGs). Therefore, the present paper advocates the alignment of the global regulatory debate about AI with the one of future successor of the SDGs in the context of the Summit of the Future to be held in September 2024. As an additional measure, the paper stresses the urgent need for a drastic reform of the present system of international organizations established within and outside the United Nation Charter System. In this regard, it offers and critically discusses different options for new models of global governance, which include but are not limited to the creation of a new international agency of AI or the establishment of a holarchic framework of global governance. In sum, it seeks to promote a debate seeking to provide a more effective and coherent global mechanism for the monitoring and enforcement of different international treaties and national laws. To this end, the paper will focus on the institutional aspects of the global governance of AI and ponder different scenarios.

Yik Chan Chin

According to the definition given by Lani Watson (2021), epistemic rights are closely linked to the creation and dissemination of knowledge—relating not only to being informed but also to being informed truthfully, understanding the relevance of information and acting on its basis to benefit themselves and society as a whole. It is highlighted that the equality nature of epistemic rights, such as equality in the access to and availability of information and knowledge, and equality in obtaining critical literacy in information and communication. While often thought of as pure information, data is a form of knowledge. The three concepts of data, information and knowledge are interrelated, but the nature of the relations among them as well as their meanings are debatable. Many scholars claim that data is the raw material for information and that information is the raw material for knowledge (Zins, 2007, p. 479). In this presentation, data is defined as a set of symbols representing a perception of raw factors. Information is organised data that has been processed into a form that is meaningful to the recipient; knowledge is understood information (Davis & Olson, 1985; Debons et al., 1988; Zins, 2007), and digital data is a set of symbols made up of units of binary code that are intended to be stored, processed and transmitted by digital computers (Zins 2007, p. 482). Personal data refers to any information that is related to an identified or identifiable natural person (Art. 4 (1), GDPR, 2016). Public data refers to the information collected, produced, or paid for by the public or government bodies. Enterprise data refers to the data collected and processed by market entities in production and business activities that do not involve personal information. Commercial data refers to proprietary data commercialized by a company and sold by professional data providers with commercial support. It needs to be imagined as data to exist and function, and the imagination of data involves interpretation. Therefore, data, as a form of knowledge, is created through social processes; its creation and definition therefore involve human agency and interpretation (Berger & Luckmann, 1967, p. 10; Haggart, 2019). As such, academic and policy debates on access to digital data and its regulation inevitably become a social construction process, involving different agencies and interpretations. The right to access data is defined as consisting of two elements: (1) a right to access public information (recognised as an individual human right by many jurisdictions and human rights bodies, see Riegner, 2017); and (2) an inclusive right for all members of society to benefit from the availability of data. Underpinned by the normative criteria of epistemic rights, this presentation examines the academic debates on access to digital data in China and EU and their related AI policies and regulations. More precisely, this presentation discusses the conceptualization of the right to access data and the related AI policy and regulatory framework. It also considers the legitimacy of those rules in relation to the public’s epistemic right to data.

AI TRUSTWORTHINESS AND REGULATIONS

Chair
Mamello Thinyane (Optus Chair of Cybersecurity and Data Science, Associate Professor, University of South Australia)

Speakers
Wayne Wei Wang (Non-Resident Fellow, Fundação Getulio Vargas; PhD Candidate, University of Hong Kong)
Eliza Mik (Assistant Professor of Law, Chinese University of Hong Kong)
Jeff Cao (Senior research fellow at Tencent Research Institute)
Jamie Brennan (Chief Product Officer DDX & Digital Transformation Specialist (AI) IOM)

• *Session Overview*

The session examined the increasing ubiquity of AI and the efforts to shape these technologies for societal good while minimizing harms. Discussions focused on aligning AI systems with societal values like fairness, transparency, accountability, and trustworthiness, and on developing regulatory frameworks, especially for high-risk domains. A key topic was the concept of Holistic Artificial Intelligence, which extends beyond traditional intelligence to include emotional intelligence. This approach aims to make AI systems more trustworthy and aligned with human values. The session emphasized the need for AI assessment and evaluation to incorporate measures of emotional intelligence and sensitivity, impacting AI model development and training data. The complexities of aligning AI systems with human values were also discussed. This includes addressing undesirable human values, translating principles into practice, and considering socio-cultural contexts. Despite enthusiasm for AI's potential, particularly Large Language Models, risks remain, especially in high-risk and low-resource domains where controls are inadequate. These risks are often underestimated due to poor understanding. Recent AI developments challenge traditional regulatory frameworks, necessitating recalibration to balance machine innovation and human creativity. The session highlighted the need for AI commons, like Foundational Models, as a digital public infrastructure supporting sustainable development globally. It also called for reforming open licensing frameworks to ensure regulatory compliance. In summary, the session provided insights into advancing AI systems that align with human values, the importance of holistic intelligence, the complexities of ethical alignment, and the need for updated regulatory frameworks to foster innovation while ensuring safety and inclusivity.

Wayne Wei Wang
The lawsuit filed by The New York Times against OpenAI and Microsoft has reignited the debate over the use of copyrighted material in AI training data. The Times has accused the defendants of illegal appropriation of its content, a claim countered by the assertion that such use is essential for the development of sophisticated AI tools. This litigation is emblematic of a broader legal trend, as evidenced by subsequent lawsuits, including a class action initiated by journalists and novelists. Consequently, there arises a critical need to recalibrate institutions within AI governance and regulation. This recalibration of AI commons as digital public infrastructure is supposed to strike a balance between fostering machine innovation and sustaining human creativity. This talk begins with a comparative analysis, defining "Foundation Models" across different jurisdictions—the EU, the US, and China—and their ongoing legislative and regulatory debates. It illustrates the role of recent technological advancements in generative AI models in triggering legitimacy issues concerning training data. During the implementation of "Model-as-a-Service," generative AI models, referred to as "Foundation Models" at the code level, have the capacity to become a new generation of infrastructure. The talk then examines the current debates in the EU AI Act regarding the special obligations of Foundation Models and their potential impact on copyright disputes. Recognizing the issue of regulatory alignment, the talk introduces the traceability obligations outlined in the currently enforced AI-related regulations, for instance, in China. In the specific context of open source in China, there is a significant interrelation between training data, similarity tests, and prompt engineering as a creative process, influenced by judicial pragmatism that supports market-friendly reasoning. Therefore, the talk proposes either the reform or fine-tuning of existing open licensing frameworks across jurisdictions, including Creative Commons, Open RAIL Licenses, and Mulan licenses. This proposal aims to maximize the creative potential of foundation models while ensuring compliance with regulatory standards to manage their risk impacts.

Eliza Mik
Public attention has been captured, if not seduced, by the potential applications of Large Language Models, or LLMs, in multiple areas. Hardly a day goes by without another headline predicting the demise of the legal profession and the democratization of legal services. There is, however, a wide chasm between user expectations as to what LLMs can do and the technical reality, what LLMs can actually do. A closer analysis of the relevant technical sources reveals a less optimistic if not alarming picture. The shortcomings of LLMs are largely misunderstood, if not ignored altogether. The result is a dangerous underestimation of the dangers they pose. Given their continuing propensity to hallucinate, to produce false statements and misinformation, LLMs are not ready for wide implementation – especially in high-risk areas like law. When evaluating the reliability of LLMs in terms of their statistical propensity to hallucinate it must be acknowledged that the detection or very existence of hallucinations may be a function of the user's competence. Experienced lawyers will notice more hallucinations in the generated text than law students, not to mention users without legal training. The latter are less likely to notice inconsistencies or possible deviations from what could be considered a legally plausible solution. They are more likely to trust and to rely on the generated answer. This raises particular concerns about the potential deployment of LLMs in downstream applications with less competent users. Relying on recent technical findings, the presentation will discuss the dangers of deploying LLMs in access to justice scenarios.

Jamie Brennan
This short form presentation will cover the need and the ability to increase capacity and artificial intelligence by incorporating emotional intelligence. This will build on previous works around the concept of Holistic Artificial Intelligence and the movement towards sapience. This 15-minute session will cover key definitions, training data and measurement and evaluation. Section 1: Holistic AI, emotional intelligence and the difference between sapience and sentience. Section 2: Training data examples with potential outcomes. Section 3: Measurement and evaluation and key indicators of emotionally intelligent AI. The purpose will be to show the necessity of increasing emotional intelligence in AI and the pathway forward, ethically.

SIDE EVENTS

AIM Global: AI for Sustainable Development Goals in Industry and Manufacturing

The event was organized by the UNU and the United Nations Industrial Development Organization (UNIDO) under the auspices of the UNIDO initiative AIM Global (the Global Alliance on Artificial Intelligence for Industry and Manufacturing. AIM Global is a multi-stakeholder platform that brings together the private sector, academia, government, and civil society to catalyze the integration of AI for sustainable industrial development.

It provided a platform to discuss the transformative potential of AI in industry and manufacturing showcasing how technological innovation can bridge divides, enhance efficiency, and drive sustainable practices across the global industrial landscape. The event gathered global thought leaders, industry experts, and academics to discuss the role of Artificial Intelligence (AI) in advancing sustainable industrial and manufacturing practices. The discussions covered a range of topics, including the implementation of AI technologies to enhance efficiency, the ethical considerations of AI deployment, and the importance of inclusive access to these technologies to prevent a widening digital divide[8].

The Global Forum on Data Governance and Digital Transformation

The event was organized by the United Nations Department of Economic and Social Affairs (UN DESA). It addressed existing challenges and gaps in national digital data governance, data management and cooperation, focusing on enhancing the institutional capacities of countries to utilize, manage and govern data in a comprehensive, objective and evidence-based manner, through regional and global cooperation. It aimed to build awareness and develop institutional capacities in building national data governance frameworks in developing countries, especially those in Africa and the Asia Pacific region[9].

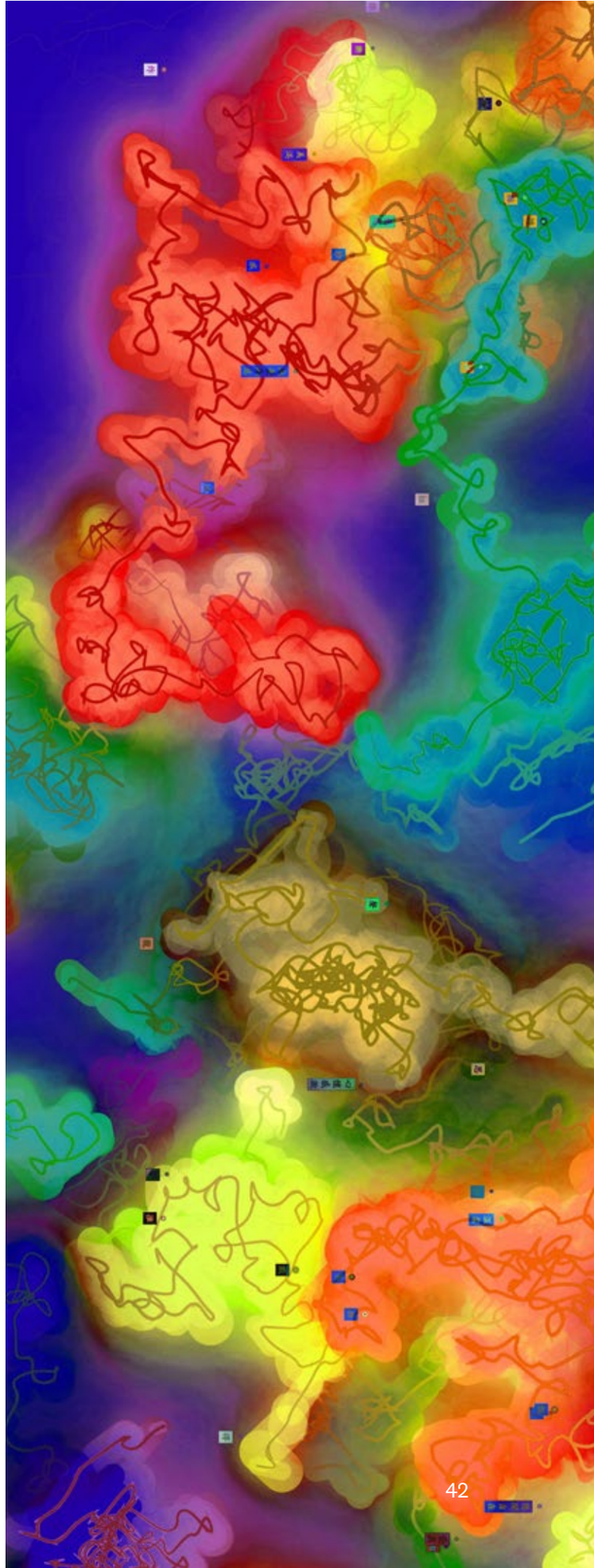
Pre-Summit of the Future Dialogue on Artificial Intelligence and Digital Technology

The event was co-hosted by the United Nations Resident Coordinator's Office in China and the United Nations University Macau. It brought together experts from the UN System, academia and the private sector to discuss the topics of applications of AI for sustainable development and AI governance frameworks, with a particular focus on how China can contribute in both of these areas in light of the upcoming discussions that will take place at the Summit of the Future in September and the ongoing negotiations of the Global Digital Compact[10].

ICTP-UNU Workshop on TinyML for Sustainable Development

The event was co-hosted by the International Centre for Theoretical Physics (ICTP), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and UNU Macau (IIST).

TinyML is a new technology that allows machine learning models to run on low-cost, low-power microcontrollers. This technology has a significant role to play in achieving the SDGs and in facilitating scientific research in areas such as environmental monitoring and the physics of complex systems. The workshop focused on applications of tiny machine learning (TinyML) that are particularly relevant to Asian researchers and provided hands-on training on commercially available hardware[11].



8 Accessed in June 2024 at: https://aim.unido.org/unido-and-unu-host-aim-global-side-event-at-unu-ai-conference-on-ai-for-sustainable-development-in-industry-and-manufacturing/
9 Accessed in June 2024 at: https://publicadministration.desa.un.org/events/global-forum-data-governance-and-digital-transformation .
10 Source: UN China.
11 Accessed in June 2024 at: https://indico.ictp.it/event/10463/material/poster/0.pdf .

Voices from the Global South, the Global North, the cultural East, and the cultural West

"...This is the first conference in the UN University Institute according to our record, and also the first UN AI conference in Macau SAR and China..." **– Jingbo Huang**
Director, UNU IIST Macau

"...AI has the potential to reshape our future for the better, but this can only be achieved through international cooperation..." **– Tshilidzi Marwala**
Rector of the United Nations University, Under-Secretary-General of the United Nations

"... it (the UNU AI network) has the potential to bring together experts from many sectors to discuss issues and challenges related to AI and to develop solutions..." **– Guy Benard Ryder, Under-Secretary-General for Policy and Under-Secretary-General of the United Nations**

"... Ensuring the interoperability of governance initiatives, addressing the digital divide, and fostering a multi-stakeholder approach will be essential for realizing the full potential of AI ..." **– Amandeep Singh Gill, UN Secretary-General's Envoy on Technology**

"...we must make sure that we leave no one behind, that benefits of AI are available for all."– **Gerd Müller**
Director General of UNIDO

"...The conversation surrounding AI governance must be a global one..." **Beate Trankmann, UN Resident Coordinator in China (a.i.)**

"...implementing safe and inclusive AI also depends on having sufficient digital skills and capacities, and this remains one of the biggest obstacles for the global South to take advantage of the transformative power of AI..." – **Robert Opp, Chief Digital Officer, UNDP**

"...Together let's work towards an inclusive AI-powered future for all..." **Lan Xue, Dean of Schwarzman College and Dean of Institute for AI International Governance, Tsinghua University, China**

"...Joining AI Network is not about what we can gain, but also what we can give, is about sharing our knowledge, our skills and our passion for AI..." **– H.E Mao Neang**
Under Secretary of State, Ministry of Post and Telecommunications of Cambodia

"...We are pleased to participate in this network and collaborate towards advancing AI for a sustainable human future..." **– Peng Gong**
Vice Rector of the University of Hong Kong

"...Technological innovation, including AI, can play a pivotal role in advancing renewable energy solutions..."
Fangli Liao, Tencent, Director at Marketing & Public Relations, Tencent

"...Bringing more focus on young scientists can enrich AI discussions and foster innovation..." **– Jane Wu**
Executive Director, Venture Cup China; Executive Secretary General, World Young Scientist Summit Secretariat, China

"...The introduction of autonomous AI systems in education could be very destructive if not managed properly..." **– Ally Nyamawe**
Researcher, UNU Macau

"...Holistic AI contributes towards AI systems that are more trustworthy and that exhibit behaviours that are aligned with human values and expectations..." **– Mamello Thinyane**
Associate Professor at the University of South Australia, Australia

"...Digital humanism is about mitigating the negative consequences of digitalization and artificial intelligence..." **– Walter Gehr, Genral Directorate for Cultural Affairs, Austrian Federal Ministry for European and International Affairs, Austria**

"...the biggest benefit out of the network is to bring together different voices and facilitating a dialogue..." **– Mamello Thinyane, Optus Chair of Cybersecurity and Data Science, Associate Professor, University of South Australia**

"...Artificial intelligence has the potential to unlock doors to a brighter future and unleash immense possibilities..." **– Ao Leong U**
Secretary for Social Affairs and Culture, Macao SAR Government.

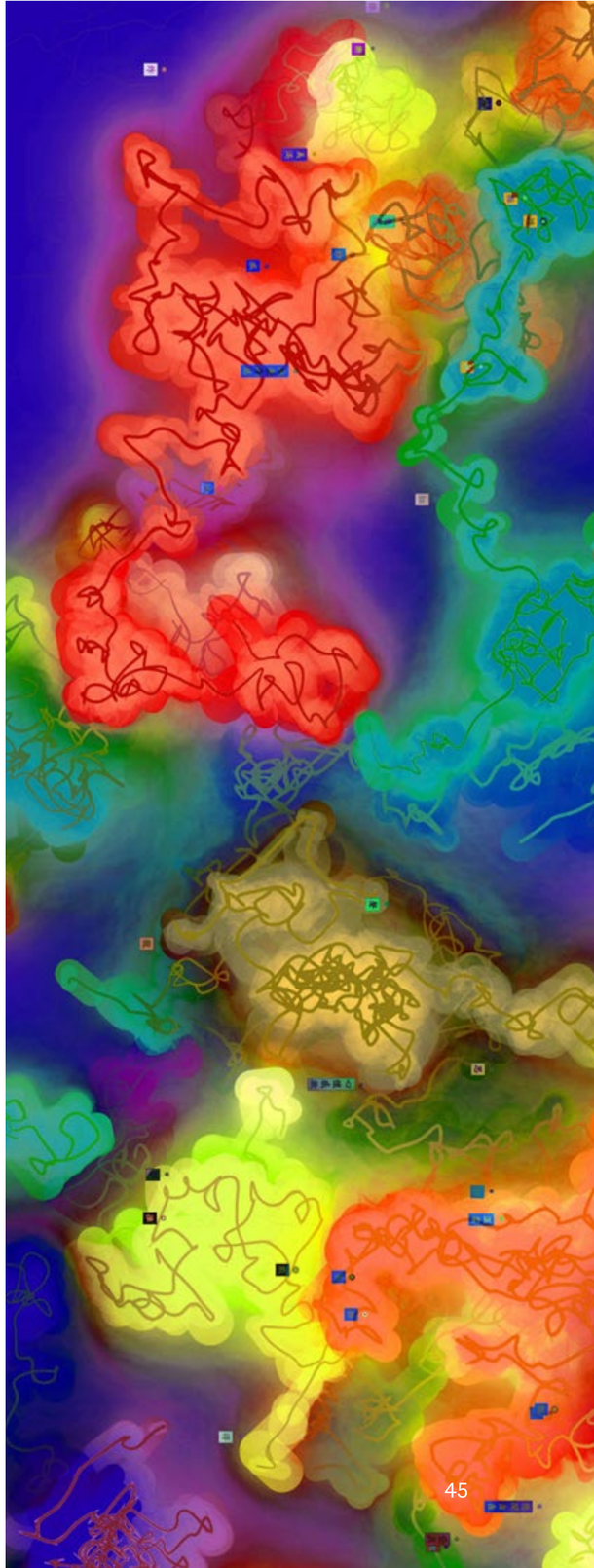
APPENDICES

APPENDIX 1

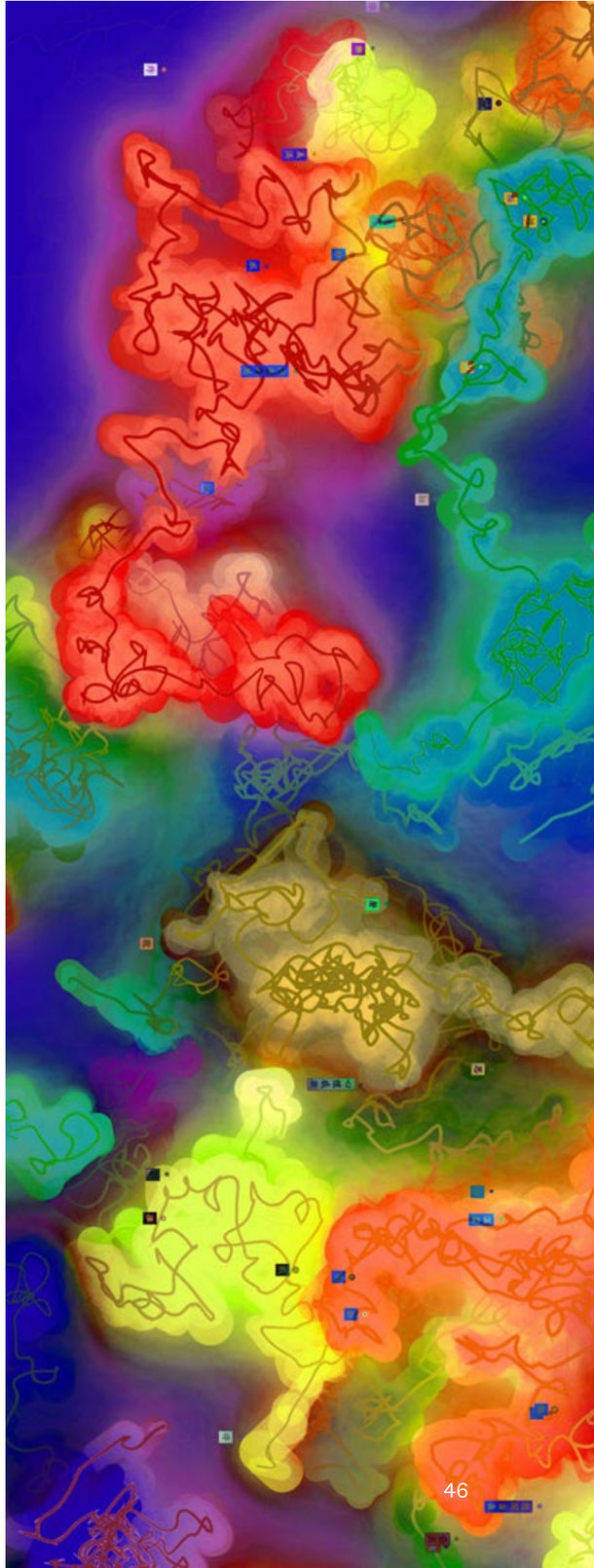
Date: **25 April 2024**
Venue: **Macau Tower, Macau, SAR, China.**

Conference programme

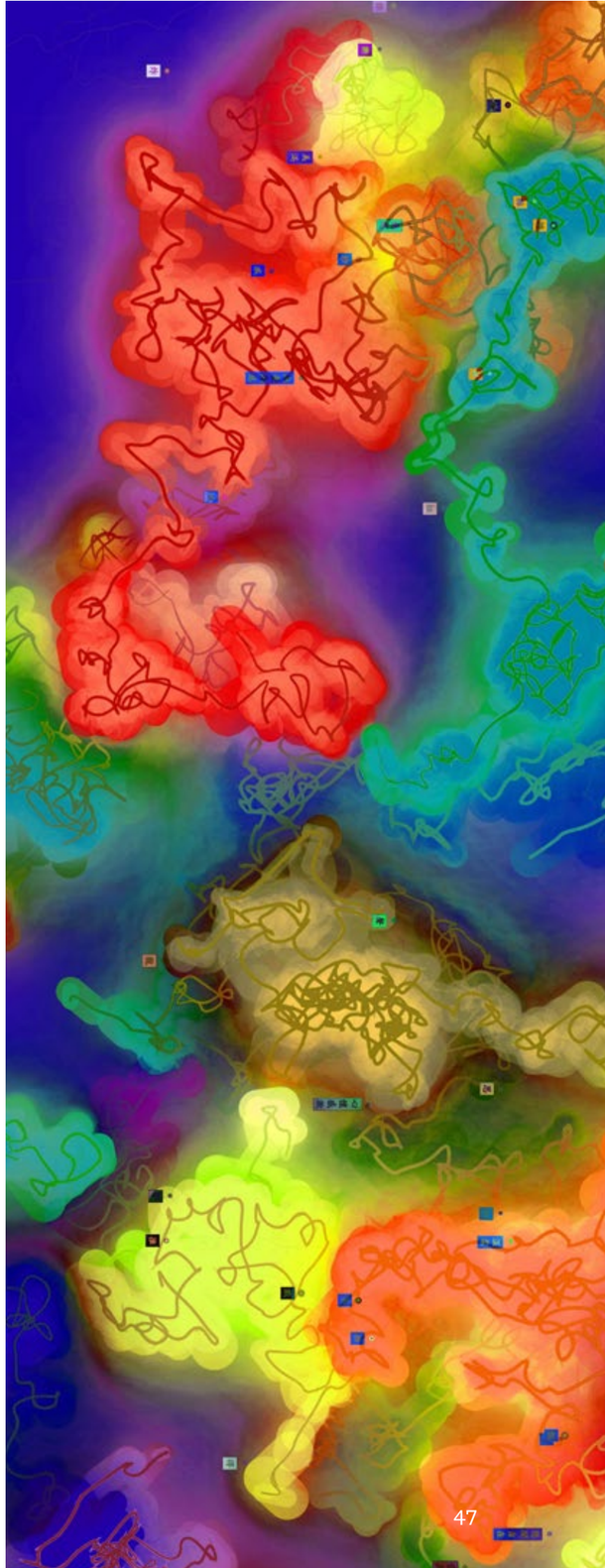
9:00-9:05	**Opening Remarks** by **Jingbo Huang**, Director of UNU Macau
9:05-9:10	**Speech** by **Ao Ieong U**, Secretary for Social Affairs and Culture, Macao SAR Government
9:10-9:15	**Speech** by **NEANG Mao**, Under Secretary of State, Ministry of Post and Telecommunications of Cambodia
9:15-9:18	**Video Message** by **Amandeep Singh Gill**, Secretary-General's Envoy on Technology, United Nations
9:18-9:20	**Video Message** by **Guy Bernard Ryder**, Under-Secretary-General for Policy, Executive Office of the Secretary-General, United Nations
9:20-9:30	**Keynote Speech** by **Tshilidzi Marwala**, Rector, United Nations University and Under-Secretary-General, United Nations
9:30-9:40	**Keynote Speech** by **Xue Lan**, Dean of Schwarzman College and Dean of Institute for AI International Governance, Tsinghua University
9:40-9:45	Tea Break
9:45-10:25	**Plenary Session: How to Use Synthetic Data to Train AI Models** Plenary Room **Tshilidzi Marwala** (Chair, Rector, United Nations University and Under-Secretary-General, United Nations) **Philippe de Wilde** (Professor of Artificial Intelligence, University of Kent) **Fernando Buarque** (Senior Associate Professor of Computing(AI), School of Engineering, University of Pernambuco, Brazil) **Mamello Thinyane** (Optus Chair of Cybersecurity and Data Science, Associate Professor, University of South Australia) **Serge Stinckwich** (Head of Research, UNU Macau) **Eleonore Fournier-Tombs** (Head of Anticipatory Action and Innovation, UNU CPR) **Yik Chan Chin** (Associate Professor, School of Journalism and Communication, Beijing Normal University)
10:25-10:35	**Launching Ceremony of UNU Global AI Network**
10:35-10:45	Tea Break



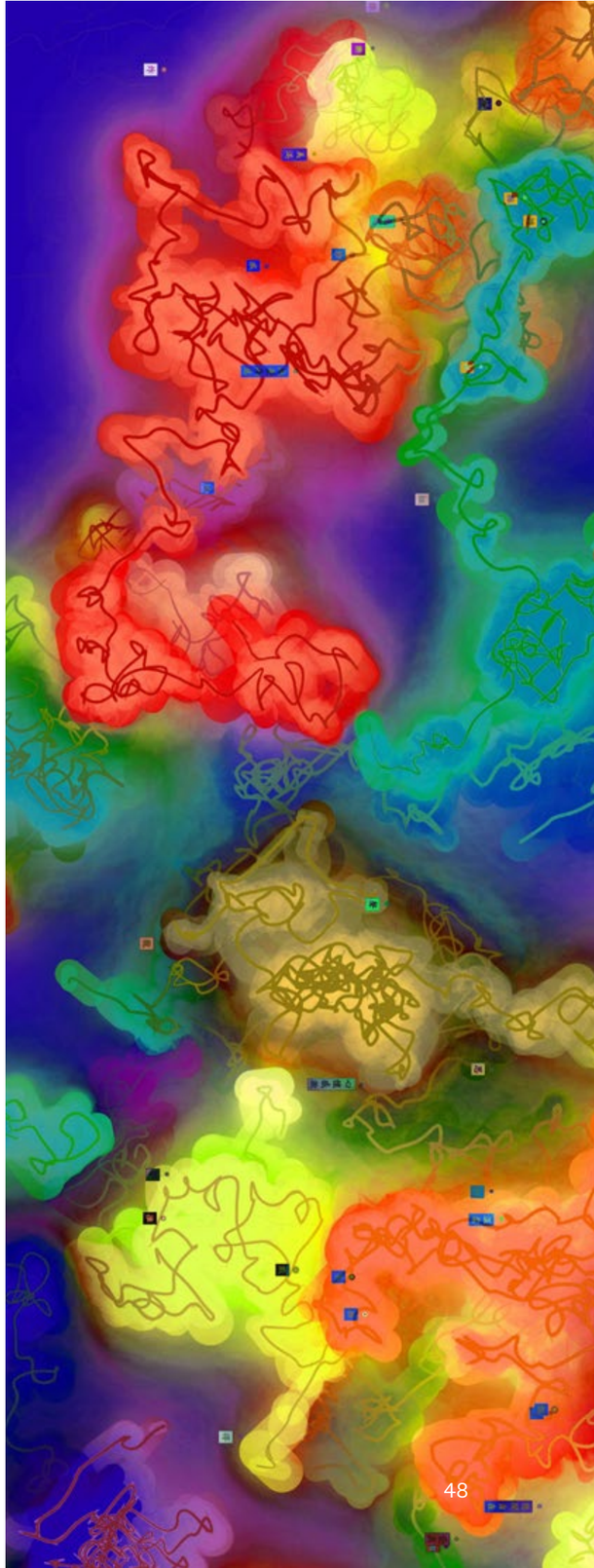
10:45-12:15 **Parallel Sessions & UNU Global AI Network Meeting**	**UNU Global AI Network Meeting** **Signing Ceremony between UNIDO AIM and UNU Global AI Network** Plenary Room **Tshilidzi Marwala** (Rector, United Nations University and Under-Secretary-General, United Nations) **Rapid Sun** (Under Secretary of State at the Ministry of Post and Telecommunications of Cambodia) **Peng Gong** (Vice Rector, the University of Hong Kong) **Fangli Liao** (Director at Marketing & Public Relations, Tencent) **Vivian Nwaocha** (Secretary General, African Society in Digital Sciences) **Jialiang Lu** (Vice Dean, SJTU Paris Elite Institute of Technology (SPEIT), Shanghai Jiao Tong University) **Ruby O** (Assistant Vice President of Sustainability & Business Synergy, MGM) **Jane Wu** (Executive Director/Executive Secretary General, Venture Cup China/World Young Scientist Summit Secretariat) **Alice Ho** (Chief Youth Officer, Global Alliance of Universities on Climate) **Gen AI Governance and Law in the Asia-Pacific Region** Parallel Session Room1 **Weidong Ji** (Chair, Chair Professor and President, China Institute for Socio-Legal Studies, Shanghai Jiao Tong University) **Yilei Shao** (Chair, Dean of the Shanghai AI-Finance School at East China Normal University) **Xingzhong Yu** (Chair Professor, University of Macau) **Mayu Terada** (Professor, Hitotsubashi University) **James Ong** (Founder & Managing Director, Artificial Intelligence International Institute (AIII) and Adjunct Professor, Singapore University of Technology & Design (SUTD) & AI Mega Centre) **Dan Linna** (Senior Lecturer & Director of Law and Technology Initiatives, Northwestern Pritzker School of Law & McCormick School of Engineering (Computer Science Department)) **Guanjun Wu** (Distinguished Professor, Dean of the School of Politics and International Relations, Director of the Institute of Singularity Studies, East China Normal University) **AI, Children and Youth** Parallel Session Room2 **Jaimee Stuart** (Chair, Senior Researcher - Team Lead, UNU Macau) **Alicja Pawluczuk** (Digital Inclusion Research Fellow at Leeds University's INCLUDE+ Network & Founder of the Digital Youth Work Research Hub [Former ICTD Research Fellow at UNU Macau) **Yi Li** (PhD Candidate at the Faculty of Law of the University of Macau) **Li Ming Wen** (Director, Population Health Research & Evaluation Hub, Sydney Local Health District; Clinical Professor, Sydney School of Public Health, The University of Sydney) **AI, Education, and Marginalisation** Parallel Session Room3 **Ronald Musizvingoza** (Chair, Researcher, UNU Macau) **Angelina Maria** (Lecturer in translation studies at the Faculty of Humanities and Social Sciences, City University of Macau) **Salvatore Mancuso** (Professor of Comparative Law and Legal Anthropology, University of Palermo) **Xiaohong Zhu** (Graduate student, Hangzhou Normal University) **Linda MENDO ABESSOLO** (Data Privacy & AI Compliance, Activist for Digital Inclusion, and Founder of "Cameroon Women First Association") **Kaize ZHU** (Incoming PhD student at the City University of Hong Kong) **Liangyue Zhang** (Ph.D. student in Journalism and Communication Studies at Fudan University) **AI for SDG Development** Parallel Session Room4 **Farzad Sabetzadeh** (Chair, Assistant Professor, City University of Macau) **Shuan Sadreghazi** (Researcher, Institute for Future Initiatives, The University of Tokyo) **Upalat Korwatanasakul** (Associate Professor, Faculty of Social Sciences, Waseda University) **Ally Nyamawe** (Researcher, UNU Macau) **AI and Climate Change** Parallel Session Room6 **Dong Liu** (Chair/speaker, Research Assistant Professor, The Chinese University of Hong Kong) **David Daou** (Research Manager Climate Risk Modelling, UNU-EHS) **Pia Faustino** (Director for Social Impact and Sustainability, Thinking Machines) **Lei Huang** (Associate Professor, Institute of Remote Sensing and Digital Earth, Chinese Academy of Science)
12:15-13:30	**Keynote by Peter Knees, and Networking Lunch L3**



13:30-15:00 **Parallel Sessions**	**Incorporating UN Values and principles into video games design powered by AI** Plenary Room **Auxane Boch** (Chair, Associate Researcher, Institute for Ethics in Artificial Intelligence (IEAI), Technical University of Munich) **Tshilidzi Marwala** (Opening, Rector, United Nations University, Under-Secretary-General, United Nations) **Gary Liu** (Managing Director Red Pavillion Limited) **Han Yang** (Head of Sustainable Lab, Boke Technology) **Qingxu Zhu** (Robotics researcher at Tencent Robotics X Lab working on reinforcement learning for control of robotics and physics-based characters) **Olivier Madiba** (CEO of Kiro'o) **Empower Young Scientist, Accelerate AI Development** Parallel Session Room1 **Jane Wu** (Chair, Executive Director/Executive Secretary General, Venture Cup China/World Young Scientist Summit Secretariat) **Sjoerd Dikkerboom** (Officer for Innovation, Technology and Science, Consulate General of the Kingdom of the Netherlands in Shanghai) **Chao ZHOU** (Senior Engineer, Nano and Advanced Materials Institute Limited) **Kai MIAO** (Assistant Professor, Director General, University of Macau, Faculty of Health Sciences, Macau Association for Young Scientists) **Erli LYU** (Lecturer, Macao Polytechnic University, Faculty of Applied Science) **AI in Healthcare** Parallel Session Room2 **Samuel Chan** (Chair, Former President,Science and Technology Development Fund (FDCT), Macau SAR) **Fhumulani Mavis Mulaudzi** (Professor, The University of Pretoria in South Africa) **Rodwell Gundo** (Postdoctoral Research Fellow, The University of Pretoria in South Africa) **Shaun Martin** (Senior Project Manager for WWF Asia-Pacific Counter-Illegal Wildlife Trade Hub) **Claudia Abreu Lopes** (Research Fellow, UNU-IIGH) **Niharika Rustagi** (Postdoctoral Fellow, UNU-IIGH) **Lei Chaoyu** (M.D. candidate, Department of Ophthalmology, Shanghai Ninth People's Hospital Shanghai Jiao Tong University, School of Medicine) **Wang Bin** (Nursing graduate student from Hangzhou Normal University) **The potential of AI in educational practice and AI-based learning environments** Parallel Session Room3 **Zhai Xuesong** (Chair, Senior Researcher, College of Education, Zhejiang University, China) **Dai Yi** (Assistant Professor of the School of Education, City University of Macau) **Wu Tinghui** (master student majoring in Educational Technology at the College of Education, Zhejiang University) **Zhang Lijie** (Master's candidate in Educational Technology at Zhejiang University) **Ji Shuang** (undergraduate student, Nanjing Normal University) **Xiao-guang Yue** (Co-Founder and Foundation Fellow of International Engineering and Technology Institute (FFIETI)) **Building Capacity with Generative AI** Parallel Session Room4 **Fernando Buarque** (Chair, Senior Associate Professor of Computing(AI), School of Engineering, University of Pernambuco, Brazil) **Avishan Bodjnoud** (Chief, Information Management Officer United Nations, Departments of Political and Peacebuilding Affairs and Peace Operations (DPPA-DPO)) **Jesse Lastunen** (Research Associate, United Nations University World Institute for Development Economics Research (UNU-WIDER)) **Yan Bai** (Assistant Professor in the Department of Strategy, Leadership and People at EADA Business School (Barcelona, Spain)) **Jie Peng** (Master of Public Management at the Hong Kong University of Science and Technology (HKUST)) **Siting Xiong** (Associate research fellow, Guangming Laboratory) **CHI CHEONG WONG** (Chief Supervisor Macau Credit and Collection Management Association) **Rita Hai Min DAI** (Assistant Professor in Education School of Education | Shanghai Jiao Tong University) **Frameworks of AI Governance** Parallel Session Room5 **Zhengkun Hu** (Chair, Director for AI Ethics and Governance, SenseTime, China), **Pankaj Pandey** (Research Scientist at the Center for Cyber and Information Security, Norwegian University of Science and Technology, Campus - Gjovik, Norway) **Craig Wing** (International Speaker, Futures strategy, scenario planning, EdgeofNowhere host, PhD Candidate) **Anuujin Sanjaajamts** (Expert of E-Government Development, Communications and Information Technology Authority (CITA), Government of Mongolia) **National AI Governance** Parallel Session Room6 **Sovann EN** (Chair, Director of Digital Government Transformation Department, Digital Government Committee) **Rapid Sun** (Under Secretary of State at the Ministry of Post and Telecommunications of Cambodia) **Xuechen Chen** (Assistant Professor in Politics and International Relations, Northeastern University (London)) **Yuting Tan** (PhD Candidate, University of Macau, Major: International Business Law and Dispute Resolution) **Sami Farhad** (Senior Lecturer of the Global Engagement Program of Zhejiang University, and Advisor to the Alibaba Group)



15:00-15:10	Tea Break
15:10-16:40 **Parallel Sessions**	**AIM Global: AI for Sustainable Development Goals in Industry and Manufacturing** Plenary Room **Ana Paula Nishio** (Chair, Chief, TCS/DAS, UNIDO) **Tshilidzi Marwala** (Opening, Rector, United Nations University; Under-Secretary-General, United Nations) **Gerd Müller** (Director General, UNIDO) **Yeshurun Alemayehu ADDE** (State Minister, ICT and Digital Economy Development Sector, Ministry of Innovation and Technology, Ethiopia) **Yanhui Geng** (Director, Huawei Hong Kong Research Centre) **LIU Hao** (Beijing Institute of Technology (BIT)) **Drazen Kapusta** (Principal of COTRUGLI Business School Europe) **Jingbo Huang** (Director UNU Macau) **AI and IoT** Parallel Session Room2 **Philippe de Wilde** (Chair, Professor of Artificial Intelligence, University of Kent) **Zihan Kan** (Assistant Professor at the Department of Geography and Resource Management, The Chinese University of Hong Kong) **Marco Zennaro** (researcher at the Abdus Salam International Centre for Theoretical Physics (ICTP)) **Thomas Basikolo** (Programme Officer in the Telecommunication Standardization Policy Department of the ITU Telecommunication Standardization Bureau (TSB)) **AI in Judicial and Legal Contexts** Parallel Session Room3 **Walter Gehr** (Chair, Genral Directorate for Cultural Affairs, Austrian Federal Ministry for European and International Affairs, Austria) **Fernando Buarque** (Senior Associate Professor of Computing(AI), School of Engineering, University of Pernambuco, Brazil) **Teng Hin Ip** (Economics Panel Chairperson, Sacred Heart Canossian College (English Section) Macau) **Vincent Mossfield** (Regional Director, Liability Risk Practice, WTW Asia) **Sara Migliorini** (Assistant Professor of Global Legal Studies at the Faculty of Law of the University of Macau) **Eliamani Laltaika** (Judge of the High Court of Tanzania and an adjunct faculty member of The Nelson Mandela African Institute of Science and Technology (NM-AIST), Arusha Tanzania) **Mlinga Idrisa Mrisho** (Ph.D. in International Investment Law, Beijing Institute of Technology) **Integrating Data to Ensure Inclusive Education of Climate Change Displaced Population** Parallel Session Room4 **Jonghwi Park** (Chair, Head of Innovation and Education, Academic Programme Officer, UNU-IAS) **Mwizerwa Myriam Abiyer** (Head of Office IOM – UN Migration - Hong Kong SAR, China Sub-Office) **Pierre Chapelet** (Senior Programme Officer, UNESCO Paris) **Serge Stinckwich** (Head of Research, UNU Macau) **AI Governance and Regulations** Parallel Session Room5 **Zheng Liang** (Chair, Vice Dean, Institute for AI International Governance of Tsinghua University) **Ansgar Koene** (Global AI Ethics and Regulatory Leader at EY) **Rostam Josef NEUWIRTH** (Professor of Law and Head for Department of Global Legal Studies at the University of Macau) **Yik Chan Chin** (Associate Professor at the School of Journalism and Communication, Beijing Normal University) **AI Agents in Practice: Harnessing AI for All** Parallel Session Room6 **Jia'an LIU** (Chair/speaker, Research Fellow at UNU Macau) **Chu Chu** (Ph.D. Candidate, Journalism School, Fudan University) **Zhiqing XIAO** (Ph.D. student in Computer Science at Zhejiang University) **Yilin ZHAO** (PhD candidate in international law at Zhejiang University) **Guiqiong CHEN** (MA in International Organization and Global Engagement from Zhejiang University) **Goshi Aoki** (Master's in Computer Science at Zhejiang University) **Yanzhuo LI** (Ph.D. student in International Affairs and Global Governance at the Department of Political Science, School of Public Affairs (SPA), Zhejiang University) **Liting CHEN** (Master's student at Zhejiang University)



16:40-17:00	Tea Break
17:00-18:30 **Parallel Sessions**	**A Gender Equality Perspective on Responsible AI** Plenary Room **Eleonore Fournier-Tombs** (Chair/speaker, Head of Anticipatory Action and Innovation, UNU CPR) **Atsuko Okuda** (Regional Director of Asia and the Pacific ITU) **Jaimee Stuart** (Senior Researcher, Team Lead, UNU Macau) **Gaelle Demolis** (Governance, Peace and Security Policy and Programme Specialist UN Women Regional Office Asia and the Pacific) **Jonghwi Park** (Head of Innovation and Education, Academic Programme Officer, UNU-IAS) **Digital Humanism – an Approach to Master the Global Challenges of Tech Power** Parallel Session Room1 **Hannes Werthner** (Chair/speaker, retired Computer Science Professor at the TU Wien, Austria) **Peter Knees** (UNESSCO chair of digital humanism and Associate Professor, TU Wien University) **Rostam Josef NEUWIRTH** (Professor of Law and Head for Department of Global Legal Studies at the University of Macau) **Xingzhong Yu** (Chair Professor at the Faculty of Law at the University of Macau) **Integrating AI with Complex Systems modelling to achieve the SDGs** Parallel Session Room2 **Serge Stinckwich** (Chair/speaker, Head of Research, UNU Macau) **Emanuele Pugliese** (Researcher, UNU-MERIT) **Jesse Lastunen** (Research Associate, United Nations University World Institute for Development Economics Research (UNU-WIDER)) **Zaber Moinul** (Senior Academic Fellow, UNU-EGOV) **Developing a UNESCO Toolkit for open science policy for data and AI in times of crisis** Parallel Session Room4 **Francis P. Crawley** (Chair/speaker, Chairman, CODATA International Data Policy Committee (IDPC)) **Perihan Elif Ekmekci** (Professor, former Head of European Union Department of Ministry of Health, TOBB University, Faculty of Medicine) **Zhenzhi (Christopher) Zhu** (Fellow with the CODATA International Data Policy Committee (IDPC); Co-chair of CODATA Connect) **Virginia Murray** (Head of the Global Disaster Risk Reduction, Public Health England) **Ana Persic** (Programme Specialist for Science Technology and Innovation Policies and Open Science, UNESCO) **AI Media, Communication, and Education** Parallel Session Room5 **Nimmi Rangaswamy** (Chair, Professor, International Institute of Information Technology Hyderabad Telangana, India) **Chu Chu** (Ph.D. Candidate, Journalism School, Fudan University) **Fernando Buarque** (Senior Associate Professor of Computing(AI), School of Engineering, University of Pernambuco, Brazil) **Min Yang** (Researcher at the United Nations University Institute in Macau) **Pia Faustino** (Director for Social Impact and Sustainability Thinking Machines Data Science) **AI Trustworthiness and Regulations** Parallel Session Room6 **Mamello Thinyane** (Chair, Optus Chair of Cybersecurity and Data Science, Associate Professor, University of South Australia) **Wayne Wei Wang** (Non-Resident Fellow, Fundação Getulio Vargas; PhD Candidate, University of Hong Kong) **Eliza MIK** (Assistant Professor of Law, Chinese University of Hong Kong) **Jeff Cao** (senior research fellow at Tencent Research Institute) **Jamie Brennan** (Chief Product Officer DDX & Digital Transformation Specialist (AI) IOM)
18:30-18:45	**Closing Performance by Coro Perosi**