UNU MACAU AI CONFERENCE

AI FOR ALL: BRIDGING DIVIDES, BUILDING A SUSTAINABLE FUTURE

POLICY DIRECTIONS
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A CONTRIBUTION TO THE
SUMMIT OF THE FUTURE

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REPORT
Policy directions distilled from the UNU Macau AI Conference, AI for All: Bridging Divides, Building a Sustainable Future. A contribution to the Summit of the Future.

United Nations University International Institute for Software Technology in Macau (UNU Macau)
Casa Silva Mendes Estrada do Engenheiro Trigo No. 4
Macau SAR, China
Tel: +853 2871 2930
https://unu.edu/macau

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Editor: Dr. Jingbo Huang
Author: Dr. Paula Hidalgo-Sanchis
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Cover photo: An Increasingly Difficult and Futile Task, courtesy of Lam Pok Yin / Vanguard Gallery.

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Note: While the author has tried to acknowledge the input from presenters at the conference in the report, it was not possible to include them all due to its length. The conference proceedings report that complements the present report compiles all the contributions from the presenters.

“...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 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 Macau 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, UN Under-Secretary-General.

FOREWORD

The UNU Macau 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.

To harness the potential of science, technology, and innovation—particularly AI—for the benefit of all humanity, UNU IIST Macau distilled from the conference the following policy directions and areas of work:

+ Building digital capacities with tailored solutions

+ Informing AI governance with research foresight

+ Supporting the UNU Global AI Network: a global platform for digital cooperation

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

EXECUTIVE SUMMARY

Under the theme *AI for All: Bridging Divides, Building a Sustainable Future,* UNU Macau connected policymakers with academics and private sector experts and facilitated a global dialogue between the Global North and the Global South, as well as between the cultural East and West.

Throughout the conference sessions, participants explored the opportunities and challenges of tapping into the transformative potential of leveraging AI technologies to advance sustainable development.

From these discussions, UNU Macau distilled the following policy directions:

BUILDING DIGITAL CAPACITIES WITH TAILORED SOLUTIONS

To make digital capacity building on AI sustainable and available, **new modalities** that are **adapted to the needs and realities in the Global South** and that are focused on impact are required. Also, promoting **knowledge exchange between experts working on the same topics from different sectors is paramount.**

INFORMING AI GOVERNANCE WITH RESEARCH FORESIGHT

To tap into the opportunities and address the new **challenges**, **risks**, and **harms** associated with the rapid **development and adoption** of **AI** solutions **and governance and regulatory frameworks, UNU Macau recognizes the need to do research applying foresight to define new areas of policy that respond to local needs, especially in the Global South.**

SUPPORTING THE UNU GLOBAL AI NETWORK: A GLOBAL PLATFORM FOR DIGITAL COOPERATION

The **UNU Global AI Network** was launched at the conference as a **global platform** to connect stakeholders, facilitate the co-creation of solutions for and with AI, and **promote evidence-based policymaking**, including the **voices** of the Global South and the **cultural East**.

COURTESY OF LAM POK YIN

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

THE CONFERENCE

A MILESTONE ON AI FOR THE SDGS

The United Nations University International Institute for Software Technology in Macau (**UNU Macau**) is part of the UN family, one of the 13 institutes of the **United Nations University**, and the only UN entity in Macau and the Guangdong-Hong Kong-Macau Greater Bay Area (GBA). The Institute, which has contributed significantly to the technological development of Macau over the past 30+ years, is an established **research** and **teaching institute** that works collaboratively to promote leveraging digital technologies to advance the 2030 Agenda for Sustainable Development at the international level.

In its role as a **UN system think tank**, UNU Macau convened a multisectoral conference that provided a platform for collaboration among diverse stakeholders around the opportunities and challenges of developing, adopting, and regulating artificial intelligence (AI) technologies to fight poverty, combat climate change, or advance education.

Under the theme *AI for All: Bridging Divides, Building a Sustainable Future*, UNU Macau connected policymakers with academics and private sector experts and facilitated a global dialogue between the Global North and the Global South, as well as between the cultural East and West.

Participants included **government officials, academics** working in a range of disciplines associated with AI, technology **industry leaders, United Nations** (UN) system **representatives, foundations, young scientists, civil society** organizations, and **host government** representatives.

The conference facilitated dialogue, discussion, learning, and knowledge exchange across three thematic pillars:

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

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

33
government institutions and initiatives

27
private sector companies

2
foundations

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.

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
Co-hosted by the United Nations Resident Coordinator's Office in China and UNU Macau.

ICTP-UNU Workshop on TinyML for Sustainable Development
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[5], **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.

5 United 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.

A LOCAL SOLUTIONS KNOWLEDGE FAIR

Participants explored the transformative potential of leveraging AI technologies to advance sustainable development throughout the conference sessions in multiple sectors and areas of work.

Speakers at the conference showcased a wide array of AI **applications**, **initiatives**, and **solutions**, from the use of AI for the diagnosis and treatment of breast cancer[6] to the use of AI and tokenization solutions in supply chain financing management[7] and the role of AI **translation** in education[8].

Throughout the conference, participants learned about AI applications built with **different technologies**, from visual element identification applied to goose farming and predictive agriculture[9] to the use of Arduino-based wireless sensor networks for weather monitoring[10].

Participants also learned about potential **new uses of AI technologies**, such as the use of AI-based System of Systems (SPS)[11] to streamline production management and boost efficiency, the use of metaverse platforms and Generative AI (GenAI) to enhance students' critical and creative thinking skills[12], the use of ChatGPT in education[13], the use of AI to enhance nursing practice in Africa[14], or the use of AI for digital health interventions in sexual and reproductive health and rights (SRHR)[15].

An array of presentations highlighted the strategic **advantages** of establishing **partnerships to implement AI-based solutions** for the 2030 Agenda. The WWF Asia-Pacific Counter-Illegal Wildlife Trade Hub, for example, presented a project that is under implementation with the technology company Atos and that will develop AI-based technology to predict hotspots of zoonoses, which are diseases that jump between species, including humans[16,17].

The conference sessions demonstrated AI **initiatives** and **approaches** from **different parts of the world**. Some from the **East**, as for example, Venture Cup China, which is an open platform that helps international universities and startups gain insight for better connections with China[18], and some from the **West**, as the *European Lighthouse to Manifest Trustworthy and Green AI initiative, Enfield*[19], which is a network of universities that promote fundamental research in adaptive, green, human-centric, and trustworthy AI[20].

The conference also showcased applications developed by the private sector, demostrating that the **private sector** is a **driving force** to expand the use of AI for sustainable development. The private sector company Tencent, for example, presented low-cost powered AI hearing aid devices with a technology that focuses on protecting speech components before undertaking noise reduction, which leads to intelligibility improvement under different noise conditions[21].

The conference displayed **AI solutions** and initiatives **designed** in **local contexts**, such as the Geospatial Intelligent Platform designed for low altitude platforms by the Guangming Laboratory in China or as the research led by UNU Macau to use participatory modeling to build agent-based models for understanding disease outbreak response in Brazil, Vietnam, and Kenya[23, 24].

6 Input by Wang Bin, Nursing graduate student from Hangzhou Normal University.
7 Input by Chi Cheong Wong, Chief Supervisor Macau Credit and Collection Management Association.
8 Input by Angelina Maria, Lecturer, Faculty of Humanities and Social Sciences, City University of Macau.
9 Shuan Sadreghaz, Researcher, Institute for Future Initiatives, The University of Tokyo.
10 Input by Thomas Basikolo, Programme Officer in the Telecommunication Standardization Policy Department of the ITU Telecommunication Standardization Bureau.
11 Input by Jie Peng, Master of Public Management at the Hong Kong University of Science and Technology.
12 Input by Tinghui Wu, Lecturer, Faculty of Humanities and Social Sciences, City University of Macau.
13 Input by Rita Hai Min DAI, Assistant Professor in Education School of Education, Shanghai Jiao Tong University.
14 Input by Fhumulani Mavis Mulaudzi, Professor, The University of Pretoria in South Africa.
15 Input by Claudia Abreu Lopes, Research Fellow, UNU-IIGH and Niharika Rustagi, Postdoctoral Fellow, UNU-IIGH.
16 Input by Shaun Martin, Senior Project Manager for WWF Asia-Pacific Counter-Illegal Wildlife Trade Hub.
17 Accessed on June 2024 at: https://atos.net/en/2023/press-release_2023_11_22/atos-and-wwf-partner-up-to-leverage-technology-to-support-biodiversity-conservation.
18 Accessed on June 2024 at: https://www.linkedin.com/company/venture-cup-china/?originalSubdomain=cn.
19 Input by Pankaj Pandey, Senior Research Scientist, Norwegian University of Science and Technology, Gjøvik, Norway.
20 Accessed on June 2024 at: https://www.enfield-project.eu.
21 Accessed on June 2024 at: https://www.tencent.com/en-us/articles/2201389.html.
22 Input by Siting Xiong, Associate research fellow, Guangming Laboratory.
23 Input by Serge Stinckwic, Head of Research, UNU Macau.
24 Accessed on June 2024 at: https://unu.edu/macau/project/building-citizen-science-intelligence-pandemic-preparedness-and-response-needs.

CHALLENGES, RISKS AND HARMS

Participants held vibrant discussions about the multiple **challenges**, **risks**, and **harms** associated with the rapid **development and adoption of AI solutions** and with the **development of governance and regulatory frameworks for AI.**

CHATGPT AND EDUCATION

Challenges associated with the impact that the explosion in use of virtual assistants based on large language models (LLMs) such as **ChatGPT** has had on the education sector, especially at the tertiary level, was discussed. Some presenters argued that while ChatGPT presents significant potential benefits for education, its integration poses challenges. Others argued that there is **a need for a shift in educational practices** to embrace innovative technologies[25] and that AI in **education** should not supplant **human capabilities** but augment them[26].

AI AND GENDER

Speakers explained that AI development can exacerbate **gender inequalities** and that the use of AI technologies can increase the **risks of discrimination, stereotyping, and the exclusion of women. This happens, especially when women do not participate in the design, development, and deployment of AI technologies**[27]. Additionally, speakers emphasized that there is limited representation of women in the field of AI[28] and a gender digital divide[29].

IMPACT OF AI ON THE VULNERABLE

Sessions highlighted the urgent need to safeguard the rights of vulnerable groups in the era of AI[30], including safeguarding the privacy, safety, and emotional well-being of children[31].

LACK OF ADHERENCE TO AI REGULATION

Presenters highlighted that in some contexts, there is a lack of compliance with AI regulation by technology companies, that AI equipment and materials used in the healthcare sector do not adhere to responsible AI principles, that the regulation of GenAI is limited in some contexts, and that some open **licensing frameworks** are not in compliance with regulatory standards.

LACK OF AWARENESS OF AI-RELATED RISKS

Discussions during the conference revolved around the **limited knowledge of the risks associated with the design and use of AI, especially among policymakers** and around the need to strengthen the supervision of AI technology to ensure that it does not exceed **human control**[32].

MISUSE OF AI

The misuse of AI technologies was discussed in different sessions, from the potential **misuse of intelligent, autonomous weapons**[33] to the increasing generation of **fake news generated by AI**[34] and new threats for women linked to AI applications that affect peace and security[35].

25 Input by Shuang Ji, Zhejiang University - Educational Technology.
26 Input by Ally S. Nyamawe, Researcher, UNU Macau.
27 Input by Eleonore Fournier-Tombs, Chair/speaker, Head of Anticipatory Action and Innovation, UNU CPR.
28 Input by Jonghwi Park, Head of Innovation and Education Programme, UNU-IAS, Japan.
29 Input by Atsuko Okuda, Regional Director of Asia and the Pacific ITU.
30 United Nations. Report of the Secretary-General. Roadmap for digital cooperation: implementation of the recommendations of the High-level Panel on Digital Cooperation. https://www.un.org/en/content/digital-cooperation-roadmap/assets/pdf/Roadmap_for_Digital_Cooperation_EN.pdf. Accessed in June 2024 at
31 Input by Yi Li, PhD Candidate at the Faculty of Law of the University of Macau.
32 Input by Fernando Buarque, Senior Associate Professor of Computing (AI), School of Engineering, University of Pernambuco.
33 Input by Chao Zhou, Senior Engineer, Nano and Advanced Materials Institute Limited.
34 Input by Fernando Buarque, Senior Associate Professor of Computing (AI), School of Engineering, University of Pernambuco, Brazil.
35 Input by Avishan Bodjnoud, Chief, Information Management Officer United Nations, Departments of Political and Peacebuilding Affairs and Peace Operations (DPPA-DPO).

OPPORTUNITIES

New opportunities to continue advancing the development and adoption of AI to achieve the 2030 Agenda for sustainable development were brainstormed at the conference.

TINYML SOFTWARE

The advantages of using **TinyML software** for **machine learning** in the **Global South** were discussed at the conference. TinyML is specialized machine learning software that allows machine learning algorithms to run on the sensors that make up the IOT. They consume much less power than giant centralized machine learning algorithms like GPT and are faster[36].

SYNTHETIC DATA

The use of **synthetic data** to train AI models, especially in the Global South, was presented. Synthetic data is data generated artificially with algorithms to simulate real-world data. It is used to train and test AI models in contexts where there is a lack of real data and to protect the privacy of the individuals behind the real world's data. This type of data is used for a wide range of applications, from health systems to cybersecurity[37].

GENAI

The use of GenAI and the metaverse in **education** was discussed. Speakers explained that GenAI applications allow art students to create new avenues for expression and have been used to produce books, games, and films[38]. In the same way, the metaverse offers new ways of learning and collaborating with other students that can revolutionize education systems[39].

GAMING

Presenters explained that AI has been used to develop games for decades, and the gaming industry has played an important role in advancing AI technologies[40]. They also explained, that while games can have educational value and teach skills like problem-solving, creativity, and design thinking, the promotion of violence in some games is a concern. Finally, the advantages of **incorporating values and principles into games to advance the SDGs**, to spur cooperation and peace can contribute to building a better future for all were discussed[41].

YOUNG SCIENTISTS

Young scientists showcased their ability to build cutting-edge AI-based technologies and solutions and their role in driving the AI industry forward. They also shared their aspirations to contribute to the advancement of the SDGs and explained the advantages of creating more opportunities for them to exchange knowledge and collaborate with other young scientists from different contexts[42]. Participants discussed the need to **invest** in **young scientists** to foster a culture of innovation in countries and to engage youth in shaping technology development[43] and the ethics around it[44]. And also, the significance of non-formal education in the context of digital transformation[45].

GREEN AI

Presenters discussed how the latest developments in large language models (LLM) for GenAI have raised awareness about the need to foster **green AI.** Presentations showed that considering energy consumption in AI development is crucial for ensuring the long-term sustainability of AI systems[46]. Also that, by developing energy-efficient algorithms and hardware, the environmental impact of AI technologies in the environment can be minimized and carbon emissions can be reduced[47].

36 Input by Philippe De Wilde, FBCS FIMA, Professor of Artificial Intelligence, Division of Natural Sciences, University of Kent.
37 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.
38 Input by Xiao-guang Yue, Co-Founder and Foundation Fellow of the International Engineering and Technology Institute (FFIETI).
39 Input by Tinghui Wu, Lecturer, Faculty of Humanities and Social Sciences, City University of Macau.
40 Input by Gary Liu, Managing Director, Red Pavillion Limited.
41 Input by Tshilidzi Marwala, Rector, United Nations University, and Under-Secretary-General, United Nations.
42 Input by Jane Wu, Director, Ventur Cup China.
43 Jaimee Stuart, Senior Researcher UNU Macau.
44 Linda Mendo Abessolo, Data Privacy and AI Compliance, Activist for Digital Inclusion, and Founder of 'Cameroon Women First Association'.
45 Alicja Pawluczuk, Digital Inclusion Research Fellow at Leeds University's INCLUDE and Network & Founder of the Digital Youth Work Research Hub.
46 Input by Tshilidzi Marwala, Rector, United Nations University and UN Under-Secretary-General, United Nations.
47 Input by Farzad Sabetzadeh, Assistant Professor, City University of Macau.

IN THE SPOTLIGHT: AI GOVERNANCE

On the launch of the High-Level Multistakeholder Advisory Body on Artificial Intelligence, the UN Secretary General called for a global, multidisciplinary, multistakeholder conversation on the governance of AI so that its benefits to humanity—all of humanity—are maximized and the risks contained are diminished[48]. Such conversation took place at the conference, with AI governance highlighted in multiple sessions as a cross-cutting issue.

Speakers presented the complex **tapestry of AI governance** frameworks and regulations in regional and national contexts. Policy directions followed at regional levels, such as those at the Association of Southeast Asian Nations (ASEAN)[49] and in the European Union's AI Act, were showcased. Additionally, policy directions followed in different countries were presented, including Australia, Singapore, Japan, China, the United Kingdom, Canada, and the United States. Local initiatives were also shown, including the Bandung Smart City in Indonesia and privacy laws in California, United States. In addition to this, Asian projects that foster trust and openness, like AI Verify[50], were highlighted.

Difference and common grounds of AI policies and regulations from different regions were discussed[51], from the emphasis on security in Chinese regulation[52] to Japan's commitment to flexible and adaptive AI regulation[53] and the focus on accountability of the recent Algorithmic Accountability Act in the United States[54].

Trends on the evolving regulatory landscape related to AI were presented, including the emphasis on identifying and managing risks, the integration of sector-specific rules into other policies, the use of regulatory sandboxes to facilitate public-private sector collaboration, the alignment with OECD guidelines and the pursuit of global collaboration to address present and future risks.[55]

CHALLENGES

While the global framework **'Recommendations on the Ethics of Artificial Intelligence'**[56] produced by **UNESCO** in November 2021 was adopted by all 193 Member States, the conference participants discussed the consequences that the lack of implementation of its principles has in different contexts and sectors. Presenters highlighted that there is **not yet** an **international framework adopted and implemented globally** that ensures that AI applications are safe, fair, accountable, transparent, interpretable, trustworthy, and aligned with human values. Along with this, presentations displayed a **fragmented national landscape** of **AI policy** frameworks across regions.

48 United Nations. UN Secretary-General's AI Advisory Body- Interim report: Governing AI for Humanity. Accessed on June 2024 at: https://www.un.org/sites/un2.un.org/files ai_advisory_body_interim_report.pdf.
49 Input by YANG Binyi, RSIS, Nanyang Technological University.
50 Input by James Ong, Founder and Managing Director, Artificial Intelligence International Institute (AIII) and Adjunct Professor, Singapore University of Technology & Design (SUTD) and AI Mega Centre.
51 Input by Liang Zheng, Vice Dean, Institute for AI International Governance of Tsinghua University.
52 Input by Xingzhong Yu, Chair Professor at the Faculty of Law at the University of Macau.
53 Input by Mayu Terada, Professor, Hitotsubashi University of Japan.
54 Input by Dan Linna, Senior Lecturer and Director of Law and Technology Initiatives, Northwestern Pritzker School of Law and McCormick School of Engineering.
55 Input by Ansgar Koene, Global AI Ethics and Regulatory Leader at EY.
56 UNESCO. Recommendation on the Ethics of Artificial Intelligence. UNESCO, 2021.

Participants discussed the urgent need to **regulate** AI and to ensure that its development benefits all society. They also discussed the need to minimizing associated risks and harms that occur due to the **lack of implementation of regulatory frameworks** for the development and use of AI applications in most countries, especially in the Global South. Speakers also highlighted the need to mainstream women's rights and gender equality in AI design, development, and governance.

Different sessions presented the new governance and regulatory risks posed by the rapid development of GenAI[57], including the need to safeguard intellectual property rights in light of AI-generated content[58] and the limitations and misuse of tools such as ChatGPT[59].

In light of the threats, risks, and harms associated with AI, speakers highlighted the need for **swift action** at both **international** and **national levels**[60] to formulate comprehensive strategies for AI governance. Some speakers emphasized the need to ensure that AI aligns with universal human rights values and principles, to address gender biases, and to promote diversity and inclusiveness in AI systems[61, 62], while others emphasized the need to align national strategies with broader national developmental objectives.

Policimakers at the conference highlighted that while many governments face similar challenges around AI development, deployment, and regulation, the **lack of avenues and opportunities for knowledge sharing** hinders collaboration among countries, especially in the Global South[63]. Also, given the evolving complex issues related to the ethical use of AI technologies, there is a need to promote the exchange of knowledge and **build the capacities** of public servants and policymakers in AI, especially in the Global South and among women overall.

OPPORTUNITIES

The conference showed that **inclusive dialogues**, consensus-building, and collective action are needed[64] to build a policy and regulatory frameeworks for the sustainable design and use of AI for all. It also demostrated the need of **global cooperation** among stakeholders, including policymakers, academics, private sector experts, and representatives from civil society, to address AI's global governance challenges and ensure that AI is developed and used responsibly and ethically, in line with **universal human rights**[65].

Speakers underlined that recent advancements in AI are challenging traditional **regulatory frameworks**,[66] and, for this reason, **agile governance**[67] frameworks are needed to balance innovation and regulation in AI[68].

The conference also presented the use of **regulatory sandboxes** for AI development to balance innovation and regulation[69]. With them, regulators can test products or services that challenge approved legal frameworks with the support of private sector companies in a controlled environment[70].

57 Input by Weidong Ji, President of China Institute for Socio-Legal Studies, Shanghai Jiao Tong University.
58 Input by Eliamani Laltaika, Judge of the High Court of Tanzania.
59 Input by Eliza Mik, Assistant Professor of Law, Chinese University of Hong Kong.
60 Input by Guanjun Wu, Distinguished Professor, Dean of the School of Politics and International Relations, Director of the Institute of Singularity Studies, East China Normal University.
61 United Nations/UN DESA. Policy Brief #92: Leveraging digital technologies for social inclusion. Accessed in June 2024 at: https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/PB_92.pdf.
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63 Input by Rapid Sun, Under Secretary of State, Ministry of Posts and Telecommunications of Cambodia.
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65 United Nations. Global Digital Compact: Background Note. Accessed in June 2024 at: https://www.un.org/techenvoy/sites/www.un.org.techenvoy/files Global-Digital-Compact_background-note.pdf
66 Input by Mamello Thinyane, Optus Chair of Cybersecurity and Data Science and an Associate Professor in the STEM unit at the University of South Australia.
67 Input by Xue Lan, Dean of Schwarzman College and Institute for AI International Governance, Tsinghua University.
68 Input by Zhengkun Hu, Director of AI Ethics and Governance Research at SenseTime.
69 Input by Yuting Tan, PhD Candidate, University of Macau.
70 OECD. Regulatory sandboxes in artificial intelligence. OECD Digital Economy Papers, No. 356, OECD Publishing, Paris, 2023.


AI
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POLICY DIRECTIONS

To harness the potential of science, technology, and innovation—particularly AI, for the benefit of all humanity, UNU IIST Macau distilled the following policy directions from the conference:

+ Building digital capacities with tailored solutions
+ Informing AI governance with research foresight
+ Supporting the UNU Global AI Network: a global platform for digital cooperation

BUILDING DIGITAL CAPACITIES WITH TAILORED SOLUTIONS

To achieve *Objective 1 - Close the digital divides and accelerating progress across the Sustainable Development Goals of the Global Digital Compact: zero draft*[71] , UNU Macau recognizes the **need to continue building digital capacities in the Global South for the design, adoption, governance, and regulation of AI technologies to advance the SDGs** in a way that maximizes their potential and minimizes risks and harms associated with them.

Many participants from the Global South conveyed at the conference that, while attending in-person trainings and knowledge sharing events are effective ways to learn, the costs of travel, time constraints, and visa requirements often limit their ability to participate. They also explained that lack of funding and staff turnover limits the ability to build the internal capacities of institutions in the long term.

New modalities that are **adapted to the needs and realities in the Global South** and that are focused on **impact**[72] are required to make digital capacity building on AI sustainable and available. These could include **increasing the opportunities for online** versus in-person trainings with online courses and webinars to complement on-site learning.

One of the aspects that participants from different sectors, including academia, government, the private sector, foundations, civil society, and international organizations, valued most, was the opportunity to **learn from peers and to share their own knowledge** others. UNU Macau recognizes that to continue building human and institutional digital capacities, particularly those related to AI for the SDGs in the Global South, promoting **knowledge exchange between experts working on the same topics from different sectors is paramount**[73, 74].

South-to-south and **triangular cooperation** are mechanisms that can be tapped into to facilitate knowledge and technology exchange on AI and co-create new knowledge and new technology uses.

71 United 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.
72 UNESCO Recommendation on Open Science. Accessed in June 2024 at: https://www.unesco.org/en/open-science/about?hub=686 .
73 Input by Rapid Sun, Under Secretary of State, Ministry of Posts and Telecommunications of Cambodia.
74 Input by Dong Liu, Research Assistant Professor, Institute of Space and Earth Information Science & Institute of Future Cities. The Chinese University of Hong Kong.

INFORMING AI GOVERNANCE WITH RESEARCH FORESIGHT

While the global framework **'Recommendations on the Ethics of Artificial Intelligence'** produced by **UNESCO** in November 2021 was adopted by all 193 Member States, the conference participants discussed the **lack of implementation** of a common set of principles regarding AI in many contexts. The conference also highlighted that there is a **fragmented regulatory landscape** at regional, national, and local levels, which challenges minimizing the risks and harms associated with AI.

To achieve *Objective 5 – Governing emerging technologies, including Artificial Intelligence, for Humanity of the Global Digital Compact: zero draft*[75], UNU Macau recognizes the need to do research applying foresight to define new areas of policy that respond to local needs, especially in the Global South.

The conference highlighted how research foresight on AI that is informed by local contexts defines new policy areas to maximize opportunities and limit risks and harms associated with AI. The conference highlighted some examples of this, including:

SYNTHETIC DATA

Synthetic data is data that has been generated with algorithms to simulate real-world data. It is used to train and test AI models in contexts where there is a lack of real-world data and to protect the privacy of the individuals behind it. It is used for a wide range of applications, from health systems to cybersecurity[76]. 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[77] 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*

75 United 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.
76 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.
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.

"...Promoting the use of synthetic data can help countries leap from technological limitations, but only if it is done safely and responsibly..."

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

Synthetic Data to Train AI Models, produced by researchers at the UNU, that was introduced at the conference. 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[78].

MAINSTREAMING WOMEN'S RIGHTS AND GENDER EQUALITY

As stated in the UN Secretary General report *Our Common Agenda*, "AI-based technologies hold the promise to find new innovative ways to create a greener, safer, and better future for all, and at the same time, can accelerate scenarios of breakdown and perpetual crisis"[79].

The research-*Artificial Intelligence and the Women, Peace and Security Agenda in South-East Asia* conducted by UNU Macau and UN Women was showcased at the conference. The research underscores the risk of AI design and training methods that reinforce societal biases and gender inequality. It also draws attention to the risk of women experiencing cyberthreats in Southeast Asia. To address these risks, the research calls for mainstreaming women's rights and gender equality in AI development and governance[80].

APPLYING THE LENS OF DIGITAL HUMANISM

The call for a moratorium on the development of AI by leaders in the industry in early 2023 highlighted the urgency to address the risks of the accelerated development of AI that occurs in a context of limited implemetation of policies and regulations in most regions of the world. The conference highlighted the need to adopt a human-centric approach for the development of AI[82], to ensure human oversight of AI decision-making processes[83] and to maintain human values in the current digital age[84].

The conference showcased initiatives such as "Digital Humanism," which promote research to develop digital technologies that are centered on human and societal needs and build on and advance social achievements[85, 86]. In words of Dr. Peter Knees[87] "the human has to be at the center, not technology and not economic interest. Specifically, universities and public research need to be supported to answer the big power of multinational IT platforms and AI companies – research and development cannot be in the hands of a few."

78 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.
79 United Nations. Our Common Agenda. Policy Brief 11. UN 2.0. Forward-thinking culture and cutting-edge skills for better United Nations system impact. United Nations, 2023.
80Eleonore Fournier-Tombs, JeongHyun Lee, Preeti Raghunath and Min Yang. Artificial Intelligence and the Women, Peace and Security Agenda in South-East Asia. UN Women Regional Office for Asia and the Pacific, 2024.
81 United 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.
82 Input by Xingzhong Yu, Chair Professor at the Faculty of Law at the University of Macau.
83 Input by Sara Migliorini, Assistant Professor of Global Legal Studies at the Faculty of Law of the University of Macau and Fernando Buarque, Senior Associate Professor of Computing (AI), School of Engineering, University of Pernambuco, Brazil.
84 Rostam Josef Neuwirth, Professor of Law and Head for the Department of Global Legal Studies at the University of Macau.
85 Hannes Werthner, Erich Prem, Edward A. Lee, and Carlo Ghezzi (eds). Perspectives on Digital Humanism. Springer, 2022.
86 Input by Hannes Werthner, Professor & Founding Father of Digital Humanism, Tu Wien University.
87 (UNESSCO chair of digital humanism and Associate Professor, TU Wien University)

"...We commit to ensuring that new technologies are shaped in ways that are human-centered..."

Global Digital Compact: zero draft[81].

SUPPORTING THE UNU GLOBAL AI NETWORK: A GLOBAL PLATFORM FOR DIGITAL COOPERATION

To achieve all the objectives of the Global Digital Compact: zero draft - Objective 1. Close the digital divides and accelerate progress across the Sustainable Development Goals; Objective 2. Expand opportunities for inclusion in the digital economy; Objective 3. Foster an inclusive, open, safe, and secure digital space; Objective 4. Advance equitable international data governance; Objective 5. Govern emerging technologies, including Artificial Intelligence, for humanity[88]; **UNU Macau recognizes the need to convey and facilitate cooperation at the global level with concrete initiatives.**

With this aim, the **UNU Global AI Network** was launched at the conference as a **global platform** to facilitate **digital cooperation** on the use of AI to advance the SDGs. The network brings together representatives from academia, the private sector, civil society organizations, foundations, and governments to learn and work together on research and policy issues related to AI. The Network objectives are:

+ **Connect** stakeholders and support **knowledge sharing** and **collaboration** on **AI for the SDGs**.
+ **Co-create solutions** for and with **AI** that are **sustained by research, inclusive**, and **sustainable** to help accelerate the SDGs.
+ **Promote evidence-based policymaking**, including the **voices** of the Global South and the **cultural East**.

Members of the network pledge to adhere to the values and principles set out in *UNESCO's Recommendation on the Ethics of Artificial Intelligence* in their activities related to AI and the Network. The Recommendations have a human-rights centred approach and the following principles:

1. Proportionality and Do No Harm
2. Safety and security
3. Right to Privacy and Data Protection
4. Multi-stakeholder and Adaptive Governance and Collaboration
5. Responsibility and Accountability
6. Transparency and Explainability
7. Human Oversight and Determination
8. Sustainability
9. Awareness and Literacy
10. Fairness and Non-Discrimination

While the UNU Global AI Network is spearheaded by the UNU, its projects and initiatives will be the result of the collective dialogue of its members. Over 30 self-identified enthusiastic network members participated in the launching ceremony at the conference, including the Federal Ministry of Austria, the Ministry of Post and Telecommunication of Cambodia, the Macau University of Science and Technology, the Institute for AI International Governance of Tsinghua University, the Norwegian University of Science and Technology, the African Society in Digital Sciences, Chunlai Education Group, MGM, Tencent, Sensetime, and Venture Cup China.

88 United 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.

UNU Global AI Network

Academia

interested in research and training on AI for good

Private sector

with AI solutions to accelerate SDGs

Individual experts

with knowledge on AI to share

Governments

interested in evidence-based decision-making related to AI that support projects

Donors and Foundations

that support project and initiatives on AI for good

Together we accelerate the SDGs and **ensure safe AI for all**

Civil society Organizations

actively engaged in AI for good at grassroots levels

UN System Organizations and other International Organizations

with a focus on AI governance and seeking research and industry partners with AI expertise

ANNUAL AI CONFERENCE

A problem-based, solution-driven event that values the **collective intelligence** of multiple stakeholders

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

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"...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.)**

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"...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

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"...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**

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"...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**

"...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.

"...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 Net
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"...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

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"...Together let's work towards an

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APPENDICES

APPENDIX 1: UNU MACAU AI CONFERENCE AI FOR ALL: BRIDGING DIVIDES, BUILDING A SUSTAINABLE FUTURE

Date: **25 April 2023**
Venue: **Macau Tower, Macau SAR**

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**

UNU Macau AI Conference
AI for All: Bridging divides to building a Sustainable Future

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[89].

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[90].

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.
Source: UN China.

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[91].

89 Source: UNIDO. 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/
90 Source: UNDESA - https://publicadministration.desa.un.org/events/global-forum-data-governance-and-digital-transformation
91 Source: https://indico.ictp.it/event/10463/material/poster/0.pdf

APPENDIX 2: UNU GLOBAL AI NETWORK MEMBERS (as of June 2024)

The number of members continues to increase and by the time of the production of this report, there are 57 members.

Government institutions

+ Austrian Federal Ministry for European and International Affairs
+ Ministry of Post and Telecommunication, Cambodia

Academia

Artificial Intelligence and Human Language Lab, Beijing Foreign Studies University
College of Education, Zhejiang University
Department of Information Sec.&Comm. Technology, The faculty of Information Technology and Electrical Engineering, Norwegian University of Science and Technology (NTNU)
Faculty of Business- City University of Macau
Guangming Lab, Shenzhen
Institute of Space and Earth Information Science, The Chinese University of Hong Kong
International Institute of Information Technology, India
Jiangnan University
Macau University of Science and Technology School of International Governance
Innovation at Guangdong University of Foreign Studies
Shanghai AI-Finance School, East China Normal University
Shenzhen Technology University Information Center
SJTU Paris Elite Institute of Technology, Shanghai Jiao Tong University
The Civic Tech Lab, National University of Singapore
"The Institute for AI International Governance of Tsinghua University (I-AIIG)"
The University of Saint Joseph (USJ), Macau
University of Hongkong
Wuhan University International Tax Law Research Center

Civil society

AI Organisation
Conservatoire National des Arts et Métiers (Cnam) & African Society in Digital Sciences (ASDS)
France Macau Chamber of Commerce
Macao Credit and Collection Management Association
Organization for Digital Africa
Policy for the People (Erevna)
Shanghai Computer Music Association
Shenzhen Artificial Intelligence Industry Association
The Ambit
The Human AI Institute
Venture Cup China

Private sector

Aereve Company Limited
BEYOND International Technology Innovation Expo
Chaihuo Makerspace
China Chunlai Education Group Co.,Ltd.
ChinaValue New Economy Think Tank
Humane AI Asia
IECG
Medisist
MGM Macau
Promptility Research
Propel
PSD Services
RAYZNEWS
Sany (Zhuhai) Investment Co., Ltd
Seeed Studio
SenseTime Intelligent Industry Research Institute
Shanghai Sustainability Communications Advisory
SJM Resorts, S.A.
Tencent
The Aula Fellowship for AI Science, Tech, and Policy

International Organization

UNIDO - AIM

And

Individuals