AI for SDGs – How Can AI Help Solve Environmental Challenges?
Japanese - German - French Conference

October 24, 2019  10:00 - 18:15
German Cultural Centre (7-5-56 Akasaka, Minato-ku, Tokyo)

Live stream at: https://youtu.be/Yial14gH3W0  Website: www.dwih-tokyo.org/sdgs
Introduction

As global temperatures continue to rise, and as we witness the impact of climate change on water availability, weather patterns, and natural disasters, discussions about what can be done continue to heat up as well. And as computers get smarter, scientists, policymakers and business people look at new ways to enlist their help in environmental protection. This is why discussions on how Artificial Intelligence (AI) systems can help to deal with climate change, to develop sustainable cities and to provide clean affordable energy are steadily intensifying.

Reflecting the fact that environmental issues affect the entire globe, the United Nations Sustainable Development Goals (SDGs), adopted in 2015 and setting global targets for 2030, also include goals relating to environmental challenges. Five of the 17 SDGs call directly on humanity to actively prevent environmental degradation: providing clean and affordable energy (7), developing sustainable cities (11), combatting climate change (13), using ocean and marine resources wisely (14), and sustainably managing forests (15).

During the trilateral conference on 24 October - United Nations Day - speakers from Germany, Japan and France will share insights into the potential of AI to combat environmental challenges. Their topics range from sustainable land use and smart agriculture to smart cities and transport systems.

The event is conducted by the German Centre for Research and Innovation Tokyo (DWIH Tokyo), and co-organized by the French Embassy in Japan as well as the Japan Science and Technology Agency (JST). It is a follow-up to Artificial Intelligence - International Research and Applications: 1st Japanese-German-French DWIH Symposium (Nov. 2018), during which participants issued a joint statement on intensified collaboration in AI.

About the DWIH Tokyo

The German Centre for Research and Innovation Tokyo (DWIH Tokyo) is a forum for German universities, non-university research institutions and research-based companies in Japan.

The DWIH Tokyo represents and promotes Germany as a location for science, research and innovation, supports knowledge exchange concerning German and Japanese science, research, and innovation landscapes, communicates between actors of both countries, and thus creates the preconditions for research cooperation. It serves as a two-way, interdisciplinary connection between Japan and Germany, and advocates exchange concerning future challenges. To achieve its mission, it relies on its research-based partners in Germany, who facilitate and shape the work of the DWIH on the ground.

www.dwih-tokyo.org
Session 1: National AI Strategies & Environmental Challenges: How to Implement Them?

Chair: Dr. Yuko HARAYAMA
Former Executive Member of the Council for Science and Technology Policy, Cabinet Office, Government of Japan; Professor Emeritus, Tohoku University

Dr. Kotaro KAWAMATA
Director, Environmental Policy Bureau, Ministry of the Environment, Government of Japan
Localizing SDGs - Circulating and Ecological Economy -
Japanese government has been promoting the “Circulating and Ecological Economy”, or CEE, to reflect the philosophy of the 2030 Agenda and achieve the SDGs. Japan has started a new programme and provided support for local governments to vitalize local resources and economies. By connecting municipalities with experts to find the most effective way to cope with social, environmental, and economic issues, this programme will translate the principles of CEE into reality. “Society 5.0”, including AI, is expected to contribute to this.

Dr. Lothar MENNICKEN
Counselor, Science and Technology, Embassy of the Federal Republic of Germany in Japan
German AI Initiatives - Using Digital Technologies for Sustainable Solutions
Germany wants to become a pioneer in achieving the Agenda 2030 SDGs by implementing the National Sustainable Development Strategy. R&D funded by the Federal Ministry of Education and Research will contribute to sustainable innovations in energy supply, circular economy, mobility and agriculture by increasing resource efficiency through new digital technologies, processes and services. Applying knowledge of sustainability research to make the digital transformation itself more sustainable is a major goal.

Renaud FRANCOU
Foresighter, Author, Former Project Manager at Fondation Internet Nouvelle Génération (FING)
Making the Digital and Environmental Transitions Converge
The environmental transition sets an inevitable time frame for our societies, while the digital transition is the driving force of our times. The environmental transition has a clear goal but is straining to find a way, while the digital transition is affecting everyday life and impelling change but without any clear collective goal. The one has a goal to reach; the other, a way to go. They need each other! How to make these two major transitions converge? How can artificial intelligence help?

Session 2: AI Applications to Tackle Climate Change – Part I
Sustainable Land Use & Smart Agriculture

Chair: Prof. Dr. Wolfgang KETTER
Director of the Institute of Energy Economics and Chaired Professor of Information Systems, University of Cologne

Prof. Frédérick GARCIA
INRA research director, MIA (Applied Mathematics and Informatics), INRA, Toulouse
AI in Agriculture for Tackling Environmental Challenges
Artificial Intelligence (knowledge representation, machine learning, automated decision making...) is at the heart of the digital transformation of agriculture. After introducing the new methods and technologies which characterise digital agriculture, I will focus on the potential of AI in agriculture for tackling environmental challenges. I will conclude by having a look at the limitations and the environmental impacts of AI and digital agriculture.
Session 3: AI Applications to Tackle Climate Change – Part II
Smart Cities & Smart Homes

Chair: Prof. Dr. Arisa EMA
Assistant Professor, Institute for Future Initiatives, The University of Tokyo

Prof. Dr. Wolfgang KETTER
Director of the Institute of Energy Economics and Chaired Professor of Information Systems, University of Cologne

(R)evolutions in Mobility: A CASE for Using AI and Smart Markets to Create Sustainable Cities
Urban populations lead the way in adopting smart tech. Urban areas can also facilitate positive change with municipal policy. The transition to sustainable energy and smart cities is wickedly complex, tempting business and policymakers with growth, but offering a minefield of unintended consequences. As artificial intelligence and machine learning enable Connected, Autonomous, Shared and Electric (CASE) mobility, how can we use the power of smart markets to create sustainable, fair and liveable cities?

Prof. Christophe CÉRIN
Professor in Computer Science and Engineering, LIPN, CNRS UMR 7030, Université Paris 13

AI for Smart Buildings
What is the difference between an Intelligent Building and a Smart Building? What is the difference between a Building Management System and a Cyber Physical System? In the jungle of terminology, the computer-scientist-in-chief will try to convince you that (computer) systems that leverage purely theoretical views are the source of better energy management, thanks to AI. A difficulty must be confronted in the ubiquitous world of cloud computing: more than a panacea, cloud is a reality.

Prof. Dr. Masaru YARIME
Associate Professor, Division of Public Policy, Hong Kong University of Science and Technology; Visiting Associate Professor, Graduate School of Public Policy, The University of Tokyo

AI-Based Innovation to Tackle Climate Change: Technological Opportunities and Institutional Challenges in Smart Cities in Japan
Smart cities play an important role in tackling climate change by promoting renewable energy sources and improving energy efficiency while strengthening resilience against natural disasters. At the same time, it is crucial to address societal concerns concerning privacy, safety, and public security in managing a vast amount of sensitive data. We will discuss policy and institutional challenges in governing AI-based innovation through open data and stakeholder collaboration in Japan and beyond.
Virtual Power Plant (VPP) Demonstration Project Activities of Tohoku Electric Power and NEXT Kraftwerke

The presentation will introduce the VPP project that Tohoku Electric Power has been working on with Next Kraftwerke, offering remote control of generators belonging to corporate customers and the batteries of local governments and households. The use of AI technology necessitates the prediction of electricity load and PV output, and optimization based on such data. In addition, use cases of AI for the optimal energy management system and power plant facilities inspection will be introduced.

How Can Machine Learning Algorithms Be Used to Develop Innovative Climate Service Products?

With the increasing amount of climate change data and information, climate service developers are faced with the task of efficiently integrating and analysing large datasets coming from a multitude of sources to develop innovative climate service products. Machine learning algorithms are helpful tools that are increasingly used to achieve this goal, but their full potential and guidelines for quality assurance need to be explored and extended. Consequently, expert networks should be established.

Towards the SDGs with Ocean Renewable Energies; Application of AI in Reducing the Uncertainties for a Sustainable Development

Renewable energies are suitable alternatives to mitigate the negative impacts of global warming. Ocean renewable energies are promising resources to provide part of the energy demand in coastal areas. However, they are affected by climate change, as well. As climate change projections with various scenarios involve a large dataset, AI can be an efficient approach to investigate the climate change impact on ocean resources by reducing the uncertainties and providing a high accuracy estimation.

New Multi-Source Data and Machine Learning Challenges in Earth Sciences and Environmental Change Hazard Monitoring

Understanding and monitoring environmental change hazard, together with quantifying the probability and the impact of extreme events has important societal economical implications. Research is being accelerated by the growing wealth and diversity of multi-source data from Earth observation; data analytics, together with expanding computational capabilities. In this context, machine learning techniques are gaining increasing attention even though they are facing new challenges associated to this wealth of multi-source, multi-scale and multi-modal data. We will provide a brief overview, in the context of the CNRS-INSU, of some of these data and ML challenges, and scientific domain illustrations in the context of environmental hazard monitoring.
The Symposium is Supported by

Institute for Future Initiatives, The University of Tokyo
Japan Society for the Promotion of Science (JSPS)

Main Supporters of DWIH Tokyo

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<td>09:30 - 10:00</td>
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<tr>
<td>10:00 - 10:15</td>
<td>Opening Remarks &amp; Greetings</td>
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<td>Dorothea MAHNKE, Director, German Centre for Research and Innovation Tokyo (DWIH Tokyo)</td>
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<td>Ina LEPHEL, Ambassador-Designate of the Federal Republic of Germany in Japan</td>
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<td>Laurent PIC, Ambassador of France to Japan</td>
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<td>Dr. Yoshimasa GOTO, Vice President, Japan Science and Technology Agency (JST)</td>
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<td>10:15 - 11:15</td>
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<td>Q&amp;A 15 min</td>
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<td>Dr. Eisaku SHIRATANI, Vice President, National Agriculture and Food Research Organization (NARO), Japan</td>
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<td>Prof. Dr.-Ing. Cornelia WELTZIEN, Director, Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB); Professor, Technical University Berlin (TUB)</td>
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<td>16:15 - 18:00</td>
<td>Panel Discussion: AI Game Changers for the Earth – Challenges, Risks &amp; Future Opportunities</td>
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<td>Jochen SCHWILL, CEO, NEXT Kraftwerke, Germany</td>
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<td>Hirobumi WADA, General Manager, Office of Digital Innovation Promotion, Tohoku Electric Power Co., Inc.</td>
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<td>Dr. Peter HOFFMANN, Senior Scientist, Climate Service Center Germany (GERICS), Helmholtz-Zentrum Geesthacht</td>
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<td>Prof. Dr. Bahareh KAMRANZAD, Assistant Professor, The Hakubi Center for Advanced Research, Kyoto University</td>
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<td>Prof. Dr. Jean-Pierre VILOTTE, Scientific Deputy for Intensive Computing and Data at the CNRS-INSU ; Director of the Paralliel Computing and Data Analysis Centre at Institut de Physique du Globe de Paris</td>
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