1ST INTERNATIONAL WORKSHOP (ONLINE)

AI-HYDRO FUTURES

Cross-disciplinary Research Network on
Artificial Intelligence (AI) in Hydrology and Climate Resilience

23 MARCH, 2026

12:30–18:00 JST | 03:30–09:00 GMT

Registration:

bit.ly/ai-hydrofutures

Host

Disaster Prevention Research Institute (DPRI), Kyoto University

Key Objectives

- Advancing the applications of AI and Digital Twin technology in hydrology and climate resilience.
- Bridging cutting-edge research for early warning, infrastructure management, adaptive water governance.
- Strengthening international collaboration, capacity building, and long-term networking across regions.

Sessions

- Climate Intelligence and Forecasting
- AI Methods for Water Systems and Hydrology
- Flood and Multi-Hazard Spatial Intelligence

Project (PI) and chairman:
Prof. Mohamed Saber

Funding Project:
FY2025 Cross-sectoral Research Platform
Development Program, Kyoto University

Organizers:
1. Prof. Sameh Ahmed Kantoush
2. Prof. Mohamed Saber
3. Prof. Sohei Kobayashi
4. Thando Sithole
5. Amirreza Tabataba Vakili

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Program

12:30-13:10 JST   Opening, Strategic Vision & Introductory Lecture

Prof. Tetsuya Sumi
Kyoto University
Japan

Welcome message: "Advancing Disaster Prevention through AI and Water Science"

Prof. Sameh Kantoush
Kyoto University
Japan

"AI-Hydro Futures: Vision, Challenges, and Global Collaboration"

Prof. Mohamed Saber
Kyoto University
Japan

"From Data to Decisions: Machine Learning in Water-Related Applications"

13:20-14:40 JST   Session 1: Climate Intelligence and Forecasting

Prof. Sunmin Kim; *Kyoto University*
"Reinforcement Learning of Flood Control for Dam Reservoir Operation without Any Forecasting Information"

Eng. Hadir Abdelmoneim; *Kyoto University*
"Uncovering Hydro-hazard Risks in MENA Region: Linking Climate Change and Teleconnections with Machine Learning"

Eng. Amirreza T. Vakili; *Kyoto University*
"Z-Number approach for addressing the uncertainty in monthly extreme precipitation prediction"

Eng. Sinh Nguyen Phuoc; *Kyoto University*
Safety of Cascading Dam Systems under Future Extreme Events: A Deep Learning-Based Assessment of Climate Change-Driven Flood and Sedimentation Dynamics

14:55-16:15 JST   Session 2: AI Methods for Water Systems & Hydrology

Prof. Vahid Nourani; *University of Tabriz, Iran*
"Emotional AI, a method to catch the peaks of hydroclimatic processes"

Prof. Rami Al-Haji; *AUM, Kuwait*
Topological Data Analysis of time series data for machine learning models using Persistent Homology

Prof. Hussan Elzain;
Sultan Qaboos University, *Oman*
"Advancing the Future Toward Digital Water: AI Application on Groundwater Hydrology"

Prof. Emad Mabrouk; *AUM, Kuwait*
"Memetic programming Algorithms for Multi-Applications"

### 16:30-17:50 JST   Session 3: Flood and Multi-hazard Spatial Intelligence

Prof. Tayeb Boulmaiz;
University of Badji Mokhtar Annaba, Algeria
"Mitigating Backscatter Ambiguity in Hyper-Arid Flood Detection: A Component-Level Analysis of Deep Learning Pipelines"

Prof. Mohamed Abdel-Fattah; *MTC, Oman*
"Flash Flood Susceptibility Mapping with Machine Learning in Al-Khaborah, Oman"

Prof. Qiuhua Liang; *Loughborough University*, *UK*
"Human and Natural Systems (CHANS) framework integrated with reinforcement learning for urban flood mitigation"
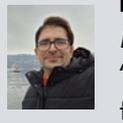
Prof. Mohammad Rajabi; *University of Luxembourg, Luxembourg*
"From 2D Maps to 3D Reality: Machine Learning for Hydrological Modeling"

17:50-18:00 JST   Closing Remarks: Prof. Mohamed Saber