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. Hussam 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