# ARTIFACT

Artificial Intelligence for Flood Resilient Infrastructure

**Newsletter #1, April 2025**

Veljko Prodanović
Green AI lead and Project Coordinator, Institute for Artificial Intelligence Research and Development of Serbia (IVI)

## Message from the Project Co-lead

It is our great pleasure to welcome you to the first edition of the **ARTIFACT project newsletter**. Launched in October 2024 and running through 2027, ARTIFACT marks a major milestone for the **Institute for Artificial Intelligence Research and Development of Serbia** (IVI). As a young institute, founded only four years ago, we are honored to coordinate our first large-scale Horizon Europe project – a transformative opportunity to grow our research excellence, deepen our project management expertise, and expand our international footprint.

**ARTIFACT – ARTificial Intelligence for Flood Resilient Infrastructure**, is more than a project. It is a collective mission to respond to the escalating risks of urban flooding brought on by climate change and rapid urbanization. By combining the power of artificial intelligence with nature-based solutions, ARTIFACT aims to revolutionize how we forecast floods, design resilient infrastructure, and build more sustainable urban futures.

At the heart of this endeavor is strong international collaboration. We are proud to partner with three of Europe's leading institutions**, Delft University of Technology** (TU Delft), **Delft Institute for Water Education** (IHE Delft), and **Hamburg University of Technology** (TUHH), whose expertise and mentorship are helping us shape a cutting-edge research agenda. Together, we are building bridges between disciplines, institutions, and countries, and proving that meaningful innovation happens when knowledge is shared across borders.

The project's vision is deeply rooted in sustainability, not only in terms of climate adaptation but also in the way we develop and apply AI technology. Through the creation of the **Blue-Green AI Hub** at IVI, we aim to ensure that AI tools are not just powerful, but ethical, inclusive, and grounded in real-world impact. By training a new generation of researchers and strengthening ties with the regional ICT industry, we hope to spark long-term, positive change far beyond the life of the project.

The first six months of the project have been incredibly dynamic. We successfully hosted our project kick-off meeting in Novi Sad, Serbia and an inspiring brainstorming session with all EU partners. We've established a global Advisory Board to keep us connected to cutting-edge developments across the globe, and we've gained media attention that has helped promote our vision and goals. Additionally, we've welcomed new PhD students and a project manager to our team, reinforcing our commitment to excellence in both science and coordination. Our digital presence is also taking shape, with the launch of the official project website and branding materials to support outreach and dissemination.

Looking ahead, the momentum continues. In the next six months, we're excited to host two expert training sessions focused on AI and urban flood modelling, and in July, we'll welcome participants to the first of our three summer schools, an exciting opportunity to engage with the next generation of researchers and practitioners.

ARTIFACT is about shaping a future where science and society move forward together, with resilience, innovation, and purpose. We're excited for what's to come, and grateful to have you with us on this journey.

Warm regards,
Veljko Prodanović
Green AI lead and Project Coordinator
Institute for Artificial Intelligence Research and Development of Serbia (IVI)

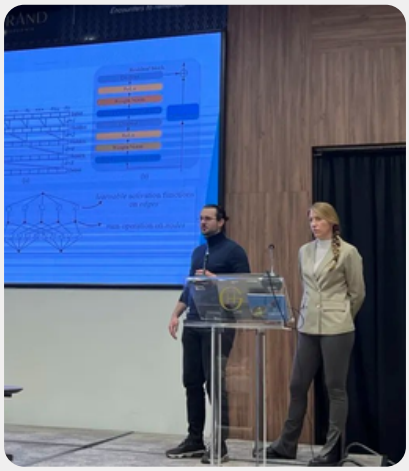
***INSIDE, WE ALSO TALK ABOUT:***

# Events and Conferences

## ARTIFACT Project Kick-off Meeting: Strengthening Flood Resilient Infrastructure

On **October 23, 2024**, the ARTIFACT project held its **kick-off meeting** at the IVI in Novi Sad, marking the start of the project's activities. The event brought together key partners from leading academic and research institutions across Europe, including **TU Delft**, **IHE Delft**, and **TUHH**, as well as important stakeholders from the **Serbian government** and **science community**.

During the meeting, participants discussed the project's goals and the pivotal role of **artificial intelligence** in enhancing **flood resilience in infrastructure**. Plans for collaboration, research, and the development of innovative flood management solutions were outlined, laying the groundwork for the project's progress in both Serbia and Europe.

## Advanced Machine Learning and Graph Neural Networks for Water Resource Management at ICIST 2025

In March of this year, our team participated in the **International Conference on Information Society and Technology (ICIST) 2025**, presenting two papers in the Digital Water Track:

- Machine Learning Techniques for Daily Reservoir Inflow Forecasting: A Case Study on Drina-Lim Hydropower Plants
- Spatio-Temporal Multi-day Streamflow Forecasting Using Graph Neural Networks

# Media

In recent months, the **ARTIFACT project** and our team members have been featured in a number of national and regional media outlets, sharing insights on how artificial intelligence is being used to improve flood prediction, prevention, and public sector innovation.
You can explore our perspectives and learn more through the following national and regional media appearances:

- **Radio Belgrade 1**
- **Radio Novi Sad**
- **Radio-television Serbia**
- **NIN**
- **NewsMax Balkans**
- **ITlog.com**
- **Al Jazeera Balkans**
- **Poslovni.hr**

These features highlight the growing relevance of AI technologies in addressing environmental and societal challenges across Southeast Europe.

# Upcoming events

**We are pleased to announce several key upcoming events associated with the Artifact project that will contribute to advancing knowledge and practices in the fields of urban drainage, flood prediction, and risk management.**

## Online Expert Training: Physically-Based Flood Simulation Models in Urban Areas

Join us on **May 14, 2025**, at **10:00 AM** for the first online expert training session, focusing on "**Strengths and Weaknesses of Physically-Based Models for Flood Simulation in Urban Areas**". This session will cover the basics of urban flood modeling, aims and objectives, and provide an overview of widely used computational models like SWMM, MIKE URBAN, and TUFLOW. **Prof. Dr. Zoran Kapelan** (TU Delft), **Prof. Dr. Zoran Vojinović** (IHE Delft), and **Dr. Natasa Manojlović** (TUHH) will lead the lectures.

***For more details and to register for both events, please visit our website: www.artifact-project.com***

## ARTIFACT SUMMER SCHOOL 2025: Advancing Urban Flood Resilience Using AI

Join us from **June 30 to July 4**, **2025**, in Novi Sad, Serbia, for the **ARTIFACT Summer School 2025**. This **free** event will focus on **AI tools for modeling urban flood risks**, exploring advanced techniques for flood prediction and resilience. Lectures on flood modeling and AI techniques will be given by **Prof. Dr. Zoran Kapelan** (TU Delft), **Prof. Dr. Zoran Vojinović** (IHE Delft), and **Dr. Natasa Manojlović** (TUHH). **Dr. Velibor Ilić**, **Dr. Milan Dotlić**, **Dr. Milan Stojković** and **Dr. Veljko Prodanović** from IVI will lead the practical sessions on **AI and machine learning** applications for **urban flood resilience**. The program also includes a field study at 3Lateral (EPIC Games).

## UDM 13th & ICFM 10th Conferences

At the UDM 13th - Urban Drainage Modelling Conference in Innsbruck, Austria (September 15-19, 2025), our team will present two papers: "**Urban Flood Prediction and Mapping Using Machine Learning and Deep Learning**", which focuses on AI techniques for flood prediction, and "**Digital Twins of Urban Drainage Systems: ML-assisted Algorithm for Processing Sensor Data**", exploring innovative ways to leverage sensor data for urban drainage systems.

In May 2026, at the ICFM 10th - International Conference on Flood Risk Management, we will present: "**Uncertainties in ML-based Daily Reservoir Inflow Forecasting: A Case Study on Drina-Lim Hydropower Plants**", focused on uncertainties in reservoir inflow forecasting, and "**Data-Centric ML for Flood Prediction: Enhancing Accuracy with Bias Correction and Remote Sensing in the Drina River Basin**", which explores improving flood prediction accuracy using data-centric ML techniques.

# First-Year PhD Student's Experience in the ARTIFACT Project

By Jasmina Moskovljević, PhD student at the Faculty of Civil Engineering, University of Belgrade,
Green AI team member at IVI

My name is Jasmina Moskovljević, and I am a first-year PhD student at the Faculty of Civil Engineering, University of Belgrade. I am also a junior researcher at the Institute for Artificial Intelligence Research and Development of Serbia.

I am honored to be part of the ARTIFACT team and to have the opportunity to collaborate with experts in the fields of machine learning and urban flood prediction. I believe this project is highly important, especially considering the increasing frequency of floods in recent years, driven by both rapid urbanization and climate change.

My research focuses on the integration of AI-based models with green and grey infrastructure to enhance flood resilience. I'm particularly interested in how data-driven approaches can support decision-making in real-time flood risk management.

One of the aspects of this project I am especially excited about is the opportunity for international collaboration. As part of the program, I will have the chance to travel to the Netherlands and Germany, where I will work alongside leading experts. I see this as an invaluable experience for expanding my knowledge and gaining diverse perspectives on the challenges and innovations in flood prediction, and of course, a chance to explore these cities and their culture.

We recently had our first meeting as part of the Early-Stage Researchers (ESR) group, where all members introduced themselves. I found our group to be particularly inspiring because it brings together people from diverse academic backgrounds, all united by a common focus: floods. I believe this interdisciplinary approach is one of our greatest strengths and will be essential for the success of our collaboration and future opportunities.

I'm also happy to share that I will be participating in my very first scientific conference, the 13th Urban Drainage Modelling Conference, where I will present a poster showcasing my work titled "Urban Flood Prediction and Mapping Using Machine Learning and Deep Learning." This is a great opportunity for me to present my research and connect with professionals and researchers.

I'm looking forward to growing both professionally and personally through this project, and I'm grateful to be part of such a dynamic and forward-thinking community.

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