

ARTIFACT

Artificial Intelligence for Flood Resilient Infrastructure

Newsletter #3, April 2026

THE ARTIFACT JOURNEY CONTINUES

We are pleased to welcome you to the latest update from the ARTIFACT project. ARTIFACT explores the potential of emerging AI technologies to address key challenges in water management, including the development of advanced flood forecasting models for urban environments. More generally, by integrating AI-driven approaches into the planning and design of flood risk mitigation measures, particularly nature-based solutions (NBS), the project aims to enhance urban flood risk management. This integration is increasingly recognised as essential for confronting future flood risks in the context of climate change. While the development and implementation of cutting-edge technology lie at the core of ARTIFACT, the project also addresses broader challenges that are crucial for ensuring the longterm impact and sustainability of such initiatives.

ARTIFACT focuses on several key areas of impact:

- The project bridges science and practice through capacity building and knowledge exchange. Expert trainings and summer schools support early-career professionals, equipping them with interdisciplinary skills at the interface of AI, hydraulic engineering and climate resilience.
- ARTIFACT builds networks and partnerships by bringing together researchers, practitioners, and institutions, fostering collaboration and knowledge transfer across disciplines and regions, with a particular focus on partner institutions and regions from Serbia, the Netherlands, and Germany.
- The project also strengthens institutional capacities, particularly through administrative staff exchanges that address the pre-award and post-award project management, supporting more effective participation in international research initiatives.
- ARTIFACT contributes to improved flood preparedness, promotes the uptake of nature-based solutions in urban flood risk management, and strengthens collaboration between science, policy, and practice across Europe and in Serbia.

INSIDE, WE ALSO TALK ABOUT:

Expert Training

Event and
Conferences

Publications

Upcoming
Events

ESR Activities



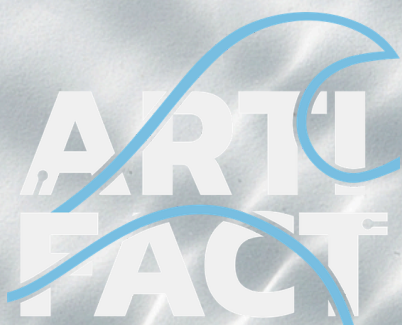
Dr. Natasa Manojlovic,
Senior Research Associate,
River&Coastal Engineering,
Hamburg University of
Technology, Germany

Now in its second project year, we are looking back what has been achieved so far. First results have already been presented at several events and conferences, including ICIST 2026 held in Serbia earlier this year. Three online expert trainings have gathered more than 100 participants, and the first ARTIFACT Summer School, held in Novi Sad in June–July 2025, successfully brought together early-career researchers and practitioners from diverse backgrounds.

Looking ahead, we are excited about the upcoming ARTIFACT activities. The second Summer School, hosted by IHE and TU Delft from July 6–10, 2026, will welcome around 25 motivated international early-career researchers and practitioners. The program will combine lectures, hands-on sessions, and technical visits, continuing our commitment to education, collaboration, and innovation in flood resilience. In addition, the upcoming staff exchange between IVI and TUHH in Hamburg scheduled for June 2026 will focus on strengthening the interface between science and industry, exploring start-up ecosystems, and discussing dissemination and exploitation in EU-funded projects. This exchange will further support knowledge transfer, foster new collaborations, and contribute to the longterm impact of the ARTIFACT partnership.

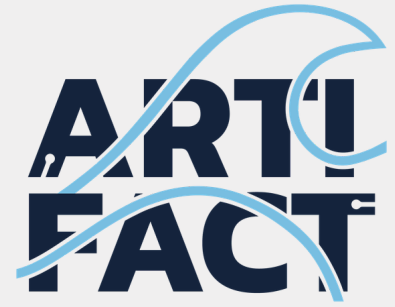
As we continue into the second year, we are proud of the progress made and are intensifying our activities for the months ahead. Thank you for being part of the ARTIFACT community. We hope you enjoy this newsletter and invite you to stay tuned for more updates as we continue the ARTIFACT journey together.

Warm Regards,
Natasa Manojlovic
Senior Research Associate, River&Coastal Engineering,
Hamburg University of Technology, Germany



EXPERT TRAINING

ARTIFACT Project Hosts 2nd and 3rd Expert Training



Expert Training #2 2D Flood Modelling in an Urban Context

On **28 November 2025**, the ARTIFACT project held its **second online Expert Training on 2D flood modelling in urban areas**. The Zoom session brought together researchers, practitioners, and stakeholders to discuss advanced approaches to urban flood risk management.

The training focused on key technical and methodological aspects of urban flood modelling. Participants were introduced to the fundamentals of 2D hydrodynamic modelling, including the importance of high-resolution spatial data, terrain representation, and rainfall inputs for accurate simulation results. Special attention was given to data collection and processing techniques, such as the use of digital elevation models (DEMs), land-use data, and drainage system information.

Participants explored how to integrate these datasets into modelling tools, calibrate and validate models, and apply them in real-world cases using MIKE+, demonstrating support for urban flood management and resilience planning.

Lectures were delivered by **Prof. Dr. Zoran Vojinović (IHE Delft)**, with the session moderated by **Prof. Dr. Zoran Kapelan (TU Delft)**. Their expertise provided participants with both theoretical insights and practical perspectives, highlighting key challenges such as climate change impacts and urbanization. An interactive Q&A session allowed participants to engage directly with the speaker and further explore practical implementation issues.

The recording of the training is available on the ARTIFACT YouTube channel:

<https://www.youtube.com/watch?v=IRNs1hTBDyE>

A YouTube video thumbnail for the training session. At the top, it says "Artificial Intelligence for Flood Resilient Infrastructure". Below that is a cityscape image with the ARTIFACT logo and tagline. The title "Expert training #2: 2D Flood Modelling in an Urban Context" is centered. At the bottom, it lists the ARTIFACT project team (Institute for Artificial Intelligence R&D of Serbia) and funding by the European Union under Horizon Europe Programme Grant Agreement 101159480. Logos for the European Union, IHE Delft, TUHH, and TU Delft are at the very bottom.

Artificial Intelligence for Flood Resilient Infrastructure

ARTIFACT
Artificial Intelligence for Flood Resilient Infrastructure

Expert training #2: 2D Flood Modelling in an Urban Context

ARTIFACT project team
Institute for Artificial Intelligence R&D of
Serbia

Funded by the European Union
under Horizon Europe Programme
Grant Agreement 101159480

Funded by the European Union

IHE Delft
Institute for Water Education
under the auspices of IHE Delft

TUHH

TU Delft

Expert Training #3 Deep Learning for Spatio- Temporal Flood Modelling

Building on the second 2D flood modelling training, the **third Expert Training on 26 March 2026** focused on **deep learning for spatio-temporal flood modelling**, showing how AI can improve urban flood predictions and support decision-making with faster, data-driven forecasting.

This session focused on deep learning for spatio-temporal flood modelling, introducing participants to how AI techniques can complement traditional hydrodynamic models. The training highlighted the use of large datasets, such as rainfall, terrain, and hydrological data, to improve prediction accuracy and better capture complex flood dynamics in urban environments.

In addition, the session highlighted how AI-driven approaches can reduce computational time and enable near real-time forecasting, supporting early warning systems. Participants also explored hybrid modelling methods that combine physics-based and data-driven approaches, showing how these solutions enhance the reliability and scalability of urban flood risk assessments.



ONLINE EXPERT TRAINING #3

DEEP LEARNING FOR SPATIO-TEMPORAL FLOOD MODELLING

- 26 March 2026
- 10:00 AM (CET)
- Online via Zoom

FREE Register via the link in the description!



The training was delivered by **Dr. Roberto Bentivoglio (TU Delft)** and moderated by **Prof. Dr. Zoran Kapelan (TU Delft)**. An interactive Q&A session allowed participants to engage directly with the speaker, providing valuable insights into the role of AI in enhancing flood risk management and supporting more resilient urban planning.

The recording of the training is available on the ARTIFACT YouTube channel:
<https://www.youtube.com/watch?v=IRNs1hTBDyE>


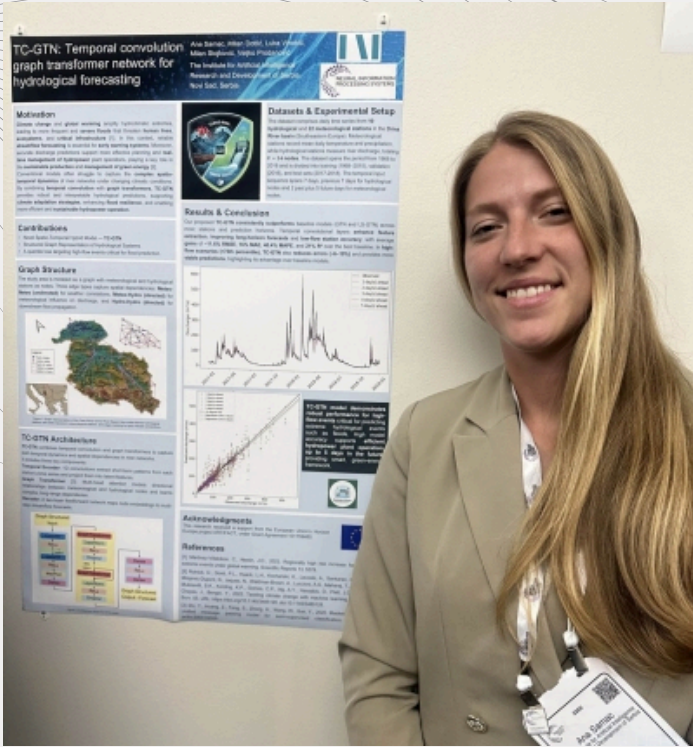


Expert Training #3:
Deep Learning for Spatio-Temporal Flood Modelling



Events and Conferences

NeurIPS 2025



The Conference on Neural Information Processing Systems (NeurIPS) is one of the most prestigious global venues in the field of artificial intelligence and machine learning, attracting over 10,000 participants annually, including leading researchers, industry experts, and technology companies.

The conference features cutting-edge research across areas such as deep learning, data science, robotics, and AI applications, making it a key platform for presenting breakthrough innovations and shaping future developments in AI.

Authors Ana Samac, Dr Milan Dotlić, Luka Vinokić, Dr Milan Stojković, and Dr Veljko Prodanović presented their research at **NeurIPS 2025**, showcasing their latest findings to the international AI community.

The paper entitled **“TC-GTN: Temporal Convolution Graph Transformer Network for Hydrological Forecasting”** explores the application of advanced AI models for river flow forecasting. The proposed approach contributes to improved flood risk management, enhanced preparedness for extreme climate events, and more sustainable hydropower system operation.



As part of this research, the model was evaluated using hydrological data from the Drina–Lim river basin, where it demonstrated improved performance in predicting both regular river flows and extreme hydrological events, highlighting its potential for real-world applications in climate-resilient water management. This work reflects ARTIFACT’s objective of strengthening research excellence and fostering the application of cutting-edge artificial intelligence methods to address complex societal and environmental challenges.

ICIST 2026

The ARTIFACT project was proud to co-organize a dedicated **Digital Water session** at the **International Conference on Information Society and Technology (ICIST 2026)**, held on Kopaonik from **March 8–10, 2026**. This session brought together leading researchers, engineers, and industry professionals from Serbia and across Europe to exchange knowledge and showcase the latest advancements in digital technologies for water management. The event served as a dynamic platform for interdisciplinary dialogue, highlighting the growing importance of digital transformation in the water sector.



A keynote presentation was delivered by Prof. Dr. Zoran Kapelan (TU Delft), who shared valuable insights into how digital solutions can enhance the efficiency, resilience, and sustainability of water systems. His talk emphasized innovative approaches in monitoring, modeling, and managing water infrastructure, drawing on real-world applications and cutting-edge research in digital water management.

The session featured a diverse and comprehensive programme of technical presentations covering a wide range of topics, including machine learning applications in flood prediction, satellite-based flood detection, deep learning models for sewer systems, and physics-informed approaches to water modeling.

Discussions also covered IoT networks for real-time monitoring, AI in optimizing water systems, and the importance of cybersecurity in digital water infrastructure.



Overall, the ARTIFACT Digital Water session showcased the value of collaboration between academia, industry, and public institutions. The exchange of ideas and case studies illustrated how digital innovation can enable more adaptive, efficient, and secure water systems, reflecting the project's commitment to sustainable and resilient water management.

Publications and Articles



New Publication:

We are pleased to share a new publication titled “**Towards adaptive stage–flow rating curve for large lowland river streams on the lower Tisza River with backwater impacts using deep learning and copula approach**”, authored by Dr. Milan Stojković, Dr. Milan Dotlić, Luka Vinokić, Prof. Dr. Zoran Kapelan, Dr. Slobodan Kolaković, and Dr. Veljko Prodanović.

The study introduces a novel hybrid framework that combines machine learning techniques with a copula-based approach to estimate stage–flow relationships in large lowland rivers affected by backwater, using the lower Tisza River (Serbia and Hungary) as a case study. By integrating classical regression methods with advanced models such as SVR, MLP, and KAN, and incorporating uncertainty analysis through synthetic datasets, the research demonstrates improved accuracy and robustness in modelling complex hydrological conditions.

Read the full publication here: <https://www.sciencedirect.com/science/article/pii/S2214581826003058>

New Editorial:

The editorial for the Special Issue “**Digital Water**” has been published in **Blue–Green Systems** by Stojković, M., Sitzenfrei, R., Lee, D., Leitão, J. P., Yang, T., and Prodanovic, V. (2026).

It highlights how technologies like machine learning, AI, and data-driven modeling are transforming water research and management. The piece also discusses opportunities for increased efficiency, resilience, and sustainability, as well as challenges such as data interoperability, real-time integration, and governance, providing a clear overview of the state of digital water science.

Read the full editorial here: <https://doi.org/10.2166/bgs.2026.015>

Upcoming Events



SUMMER SCHOOL 2026

We are excited to share that the **ARTIFACT Summer School 2026** is just around the corner! Scheduled for **July 6–10 in Delft, Netherlands**, this program brings together students and researchers to explore flood modelling, nature-based solutions, and the application of AI in water management. Over five days, participants will gain hands-on experience with physics-based models, machine learning techniques, and real-world flood scenarios, while also enjoying opportunities for networking and collaboration.

Registrations for the Summer School were recently closed on April 12. We were pleased to receive a strong level of interest from researchers and students across diverse backgrounds. The selection process is currently underway, and applicants will be informed in due course.

Stay tuned for highlights and key takeaways in our upcoming newsletters!

Don't miss out!

ARTIFACT

MODELLING URBAN FLOODS WITH PHYSICAL AND AI MODELS

6 July - 10 July 2026
Delft, the Netherlands

Registration closes:
12 April 2026

SUMMER SCHOOL 2026

IW **TUHH** **TU Delft** **IHE DELFT**
Hamburg University of Technology

ESR Activities

Dom omladine Beograda

GRANICE I MOGUĆNOSTI:
VEŠTAČKA INTELIGENCIJA
U OBRAZOVANJU, KULTURI I DRUŠTVU

Veštačka inteligencija u prirodnim, tehničkim i društvenim naukama

7. 4. 2026. u 19.00

In our Early Stage Researchers section, we highlight Ana Samac's inspiring presentation at the panel "**Artificial Intelligence in Natural, Technical, and Social Sciences**", held on Tuesday, **April 7, 2026**, at DOB//Club, **Dom omladine Beograd**. Ana showcased how advanced AI models help protect communities, from flood prediction to improving urban planning and strengthening public trust. She also emphasized the educational potential of these technologies, demonstrating how open data and visualizations can be integrated into project-based learning, fostering interdisciplinary learning for students and early career researchers alike.

Delft Study Visit



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

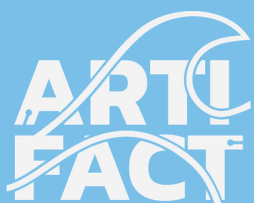
As part of the ARTIFACT project, I had the opportunity to spend two months at the Delft University of Technology, in Delft, Netherlands, an experience that proved extremely valuable for my academic and professional development. What made this visit especially meaningful was the collaboration with colleagues from the TU Delft, which allowed me to exchange ideas, gain new perspectives, and receive constructive advice. This interaction broadened my understanding and inspired my own work.

Being part of the project also offered a unique chance to connect with researchers from around the world. Despite different schedules, we often found time to share coffee and conversations, exchanging stories and insights that enriched the experience. Attending colloquia at TU Delft, organized by professors and researchers, provided further opportunities to explore new ideas and learn from experts eager to share their knowledge.



During my time at TU Delft, I also had the chance to observe the dynamic academic environment, where students and researchers engage closely with ongoing projects and interdisciplinary initiatives.

Overall, the TU Delft study visit was not only a milestone in my research journey, but also an opportunity to develop teamwork, communication, and intercultural skills, all within a vibrant and collaborative academic setting.



ARTIFACT is funded by the European Union under Horizon Europe Programme, Grant Agreement 101159480. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.