

Newsletter

Welcome to the latest edition of our BRIDGITISE Newsletter!

As we complete the first year of the project, this edition aims to provide a comprehensive overview of the progress achieved during the second semester and outline key plans for the future. This newsletter includes the following highlights:

- The successful recruitment of 16 Doctoral Candidates (DCs), marking a significant milestone in advancing the project's objectives.
- Key insights and outcomes from the second consortium meeting held in Bari, Italy, in November 2024, where partners convened to review progress and define strategic priorities.
- A forward-looking view of activities planned for 2025 and beyond, including the organization of a training school and an end-user workshop.

Recruitment of Doctoral Candidates

Over the past year, all DCs of the BRIDGITISE project have been successfully recruited and approved by the consortium. The DCs represent a diverse group, coming from nine countries across the globe: Iran, India, China, Italy, Pakistan, Norway, Lebanon, Colombia, and Vietnam. This diversity underscores the project's commitment to fostering a professional, multidisciplinary, and multicultural environment aimed at revolutionizing bridge management through digital technologies.

A brief overview of the DCs' backgrounds is presented below.

Candidate: Mohsen Rezvani Alile

DC1 Position: CROWD - Mobile Crowdsensing and IoT for Bridge System Identification

Host organisations: Politecnico di Milano (Italy) & Egnatia Odos (Greece)

Secondment organisation: Exprivia Spa (Italy)

Background & Motivation: Mohsen holds a Master's degree in Earthquake Engineering from Sharif University of Technology, with expertise in vibration-based methods and structural dynamics under moving loads. He is driven by the potential of innovative, cost-effective solutions like mobile crowdsensing to revolutionize continuous structural health monitoring.



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Candidate: Asmit Roy Burman

DC2 Position: SATELLITE – Integration of InSAR-derived and environmental measurements for anomaly detection

Host organisations: Politecnico di Milano (Italy) & Tre Altamira (Italy)

Secondment organisation: KTH Royal Institute of Technology (Sweden) and Ramboll (Denmark)

Background & Motivation: Master's in Remote Sensing and GIS from IIRS-ISRO, specializing in disaster risk management and urban infrastructure impacts. He is inspired to develop sustainable solutions for bridge integrity management while promoting collaboration between India and Europe.



Candidate: Amir Zarebeiranvand

DC3 Position: DRONES – Automated visual inspections of bridges using Unmanned Aerial Systems and vision-based digital imaging

Host organisations: Politecnico di Bari (Italy) and EXPRIVIA Spa (Italy)

Secondment organisation: IBM Research GMBH (Switzerland)

Background & Motivation: Master's in Control Engineering from Amirkabir University, specializing in autonomous UAV systems. He aims to revolutionize bridge inspections with safer, cost-effective UAV solutions, focusing on advanced communication and inter-UAV collaboration to enhance infrastructure monitoring.



Candidate: Mohamad Taghizadeh

DC4 Position: WIM – Advanced Bridge Weigh in Motion (B-WIM) performance using vision-based data and machine learning

Host organisations: ZAG Ljubljana (Slovenia) and CESTEL (Slovenia)

Secondment organisation: University of Twente (Netherlands) and University of Bari (Italy)

Background & Motivation: Master's in Electrical Engineering from Iran University of Science and Technology, specializing in Artificial Intelligence (AI) and computer vision using Deep Learning (DL) and Machine Learning (ML). He aims to advance infrastructure monitoring by developing robotic systems for bridge inspection, focusing on autonomous navigation, object detection, and segmentation to ensure precision and reliability.

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Candidate: Qing-Chen Tang

DC5 Position: EDGE – Edge computing and dense low-cost sensing for early damage detection

Host organisations: SACERTIS Ingegneria (Italy) and KTH Royal Institute of Technology (Sweden)

Secondment organisation: Politecnico di Milano (Italy)

Background & Motivation: Master's in Bridge Engineering from Beijing Jiaotong University, specializing in dynamics of train-bridge systems and vibration control. With experience in ML for noise and vibration mitigation, he aims to develop edge computing and dense low-cost sensing technologies.



Candidate: Nicola Farronato

DC6 Position: ROBOT – Robots, such as Boston Dynamics SPOT

Host organisations: IBM Research GMBH (Switzerland) and ETH Zürich

Secondment organisation: Politecnico di Milano (Italy)

Background & Motivation: Master's in Control Systems and Computer Engineering from the University of Padova, specializing in computer vision and deep learning. With three years of experience in developing vision algorithms across industries, he aims to optimize large vision models for edge computing, enabling efficient, sustainable, and real-time autonomous robotic inspections.



Candidate: Khan Adil Poshad

DC7 Position: PLATFORM – An advanced digital platform to integrate SHM data into bridge management

Host organisations: BEXEL Consulting (Serbia) and ZAG Ljubljana (Slovenia)

Secondment organisation: Politecnico di Milano (Italy) and Tallinna Linn (Estonia)

Background & Motivation: Master's in Structural Engineering from the Budapest University of Technology and Economics, specializing in Structural Health Monitoring (SHM) and Building Information Modeling (BIM). With experience in practical applications, he aims to develop a digital platform for integrating SHM data into bridge management.

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Candidate: Zaheer Safeer Ahmad

DC8 Position: TWINS – Probabilistic Digital Twins for continuous bridge performance modelling

Host organisations: North Consulting (Denmark) and Sacertis Ingegneria (Italy)

Secondment organisation: Politecnico di Milano (Italy)

Background & Motivation: Master's in Structural Engineering from the Budapest University of Technology and Economics, specializing in Structural Health Monitoring (SHM) and Building Information Modeling (BIM). He aims to develop probabilistic digital twins for continuous bridge performance.



Candidate: Faisal Hussain

DC9 Position: CYBER – Advanced and secure identity provisioning and network monitoring for augmented bridge infrastructures

Host organisations: Politecnico di Bari (Italy) and EXPRIVIA Spa (Italy)

Secondment organisation: Egnatia Odos (Greece)

Background & Motivation: Master's in Computer Engineering from the University of Engineering and Technology, Pakistan, specializing in artificial intelligence, cybersecurity, and healthcare systems. With more than three years of full-time research experience, he aims to develop advanced AI models, focusing on IoT security, machine learning, and data analytics.



Candidate: Liv Breivik

DC10 Position: NEURAL – Machine learning for deterioration prediction based on digital information streams

Host organisations: KTH Royal Institute of Technology (Sweden) and Pedelta (Spain)

Background & Motivation: Master's in Applied Physics and Mathematics from NTNU, Norway, specializing in Industrial Mathematics. With experience in numerical mathematics and neural networks, she aims to develop machine learning models for deterioration prediction using sensor data to be used in the bridge industry.

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Candidate: Rizwan Ullah Khan

DC11 Position: VISUAL - Augmented reality enhanced bridge condition assessment

Host organisations: University of Twente (Netherlands) and Ingenieursbureau Westenberg (Netherlands)

Secondment organisation: Politecnico di Bari (Italy)

Background & Motivation: Master's in Mechatronics Engineering from the NUST, Pakistan, specializing in industrial robotics and computer vision. With research experience in personality trait identification, rehabilitation game prototypes, and energy-efficient algorithms, he aims to revolutionize bridge inspections using computer vision and augmented reality.



Candidate: Elie Issa

DC12 Position: CIRCULAR - Circular life cycle management of bridges

Host organisations: University of Twente (Netherlands) and Cemosa (Spain)

Secondment organisation: Croatian Motorways Ltd (Croatia)

Background & Motivation: Master's in Civil Engineering from the University of Bologna, specializing in sustainable urban mobility. With research experience in urban planning and virtual reality for public space auditing, he aims to enhance bridge life cycle management and sustainability by developing decision support tools.



Candidate: Bryan Castillo

DC13 Position: CODES - Small data becoming big data

Host organisations: North Consulting (Denmark) and Ramboll (Denmark)

Secondment organisation: Politecnico di Milano (Italy)

Background & Motivation: Master's in Civil Engineering from Universidad del Valle, Colombia, specializing in structural and dynamic engineering. With experience in structural health monitoring and probabilistic modelling, he aims to develop advanced probabilistic models integrating monitoring data for enhanced bridge design and sustainability.

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Candidate: Nam Le Hoang

DC14 Position: CORROSION - Hybrid modelling of corrosion in reinforced concrete structures using heterogeneous data

Host organisations: Politecnico di Milano (Italy) and Socotec Monitoring (France)

Secondment organisation: University of Lund (Sweden)

Background & Motivation: Master's in Civil Engineering, specializing in Building and Energy Efficiency. With expertise in mathematical and structural analyses, he aims to develop hybrid corrosion models using Bayesian Probabilistic Networks, integrating data from diverse sources.



Candidate: Castro Giraldo Sergio Andres

DC15 Position: VALUE - Value quantification of digital information systems for climate change mitigation

Host organisations: Ramboll (Denmark) and University of Lund (Sweden)

Background & Motivation: Master's in Natural Hazards and Risks in Structural Engineering from Bauhaus-Universität Weimar, Germany, focusing on structural dynamics, FEM, and bridge analysis. He aims to develop methodologies for quantifying the benefits of digital monitoring systems in bridge maintenance.



Candidate: Ghani Muhammad Irfan

DC16 Position: D-BIM: Building Information Modelling for decision support

Host organisations: Wolfel Engineering Gmbh (Denmark) and University of Lund (Sweden)

Secondment organisation: Bundesanstalt für Straßenwesen (Denmark)

Background & Motivation: Master's in Structural Engineering from the Budapest University of Technology and Economics and a Master's in Building Information Modelling (BIM) from the University of Ljubljana and Politecnico di Milano. With experience in large-scale BIM projects, he aims to explore the potential of BIM in decision support, focusing on lifecycle and integrity management for sustainable infrastructure.

Highlights from the Bari Consortium Meeting

The second BRIDGITISE Consortium Meeting was held on November 14 -15, 2024, in Bari, Italy, and was organized by Politecnico di Bari. This meeting brought together DCs and project partners to discuss progress and future directions for BRIDGITISE. Members of the External Advisory Board, including Prof. Jesús Rodríguez Santiago (Universidad Politécnica de Madrid), Dr. Marianna Loli (Grid Engineers), and Prof. Helmut Wenzel (Wenzel Consult), participated in the discussions, contributing valuable insights to the project's development.

Day 1: November 14, 2024

The BRIDGITISE Consortium Meeting started with a warm welcome from hosts Dr. Nicola Cordeschi (POLIBA) and the project coordinator, Prof. Maria Pina Limongelli (POLIMI), followed by participant introductions.

The technical part of the meeting included presentations from the External Advisory Board members. Prof. Jesús Rodríguez Santiago, updated the consortium on the advances in Eurocode 2 and Dr. Marianna Loli focused on flood risk management and resilience strategies, linking field evidence to practical investment planning tools for infrastructure.

The DCs presented their research topics, showcasing the diversity and relevance of their work.



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Eng. Isabella Alovise (SACERTIS) outlined the project's communication and dissemination strategy, including plans for journal publications, conferences, and end-user workshops. For the workshops organization, a task force consisting of industrial partners and members of the External Advisory Board was created to efficiently engage end-users in the project.



To end the day, participants gathered for a networking dinner in the heart of Bari's old town, enjoying the authentic flavours of local cuisine.



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Day 2: November 15, 2024

The second day focused on digital bridge management and monitoring, with Prof. Helmut Wenzel emphasizing the integration of monitoring technologies and presenting case studies of notable bridge projects.

Dr. Mateja Košir (ZAG) provided guidance on Intellectual Property Rights (IPR), stressing the importance of protecting innovation and compliance with project agreements.

Training plans for DCs were detailed by Prof. Maria Pina Limongelli and a task force was created to support the organisation of the training schools.

The meeting concluded with recommendations by the External Advisory Board on fostering industry collaboration and ensuring practical impact.

Activities within 2025 and beyond

The BRIDGITISE project has a dynamic agenda for 2025 and beyond, focusing on training schools, dissemination activities and three workshops that intend to increase the interaction with end-users.

The first training school is scheduled for May 12-16, 2025, at the University of Twente (The Netherlands) designed to enhance DCs' technical and soft skills. Lectures will be given by academic and industrial partners to bring closer to the industrial needs of the individual projects of the DCs'. External industry representatives will also be invited to achieve this goal. Preparatory periodic meetings will take place, starting from January 2025, among the members of the task force to organise efficiently the training school.

Communication and dissemination efforts will ramp up, including the publication of research papers by DCs in peer-reviewed journals and the prosecution of BrIMBites posts starting January 2025. The posts will be periodically prepared by DCs to uncover interesting facts about bridge management and enhance their awareness of digital technologies.

Workshops aimed at engaging end-users will commence with an online session in October 2025, followed by two physical workshops in June 2026 and June 2027.

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Also in this case, preparatory periodic meetings will take place, starting from January 2025, among the members of the task force to identify and reach out to industries with high expertise and impact on bridge management.

Finally, the BRIDGITISE Citizen Science Event and Bike Tour, organized by POLIMI, will be a two-day co-creation activity along the VENTO cycling route, engaging DCs, supervisors, and local stakeholders.

The event features a bike tour involving diverse citizens to disseminate project insights, hands-on demonstrations of DCs' innovations like drones and robots, and feedback collection to enhance project outcomes.



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