EUROSTRUCT

EUROPEAN ASSOCIATION ON
QUALITY CONTROL OF BRIDGES AND STRUCTURES

TRAINING SCHOOL

Slovenian National Building and Civil Engineering Institute (ZAG)

Slovenia, Ljubljana

17 October – 20 October, 2023

BRIDGE ASSESSMENT TRAINING SCHOOL ZAG

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QUALITY CONTROL OF BRIDGES AND STRUCTURES

DATE OF EVENT
17 – 20 October 2023

Slovenian National Building and Civil Engineering Institute
Ljubljana, Slovenia

ACTION CONTACTS

EuroStruct	Dr. Irina Stipanovic	i.stipanovic@utwente.nl
Local organizers	Dr. Andrej Anžlin Dr. Maja Kreslin Dr. Mirko Kosič Doron Hekič Dr. Aleš Žnidarič	andrej.anzlin@zag.si
Action websites	http://eurostruct.org	
LinkedIn event	Event link	

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1. INTRODUCTION

1.1. ABOUT

The objective of the EUROSTRUCT Training School, hosted by the Slovenian National Building and Civil Engineering Institute (ZAG), Department of Structures, Section for Bridges and Other Civil Engineering Structures, is the exchange of knowledge and experience in quality control, to encourage awareness and responsibility of structural engineers towards the needs of society, and to encourage actions necessary for the progress of quality control in bridges and structures.

In this training school, trainees will elevate the expertise in bridge inspection, structural health monitoring, structural safety analysis and bridge life cycle management at the prestigious EUROSTRUCT Training School.

Join us in Ljubljana, Slovenia, from October 17 - 20, 2023, as we bring together young researchers, professionals, and decision-makers to explore groundbreaking advancements in bridge engineering:

- Comprehensive Digital Bridge Inspection
- Next-Generation Health Monitoring for Structures
- Structural Safety Analysis
- Smart network level decision making

Immerse yourself in the Slovenian-based experience, gaining invaluable insights into:

- Digital inspection technologies, like Unmanned Aerial Vehicles (UAVs) and digital models
- Innovative Structural Health Monitoring (SHM) techniques, including soft-load testing with Bridge Weigh-In-Motion (B-WIM) systems and structural model updating based on measured response
- Bridge assessment strategies for existing bridges, considering traffic, hydrodynamic loads and scour, and seismic loads

Trainees will also engage with and use essential tools such as:

- Structural analysis using FEM models (software Midas Civil)
- On-site experience in bridge inspection and SHM living-lab facilities
- Analysis of SHM data to support bridge assessment analysis using DewesoftX and Python software

Connect with fellow trainees in hands-on problem-solving sessions and use the knowledge gained in your daily practice and research projects.

EuroStruct's training school offers targeted instruction for young researchers, professionals, and decision makers to collaborate on problem-solving sessions. Participants gain practical knowledge applicable to their daily work and research, empowering them to become influential figures in bridge management.

Venue: Slovenian National Building and Civil Engineering Institute, Ljubljana, Slovenia
Time: 17 – 20 October 2023
Capacity: 15-25 trainees
Fee: 400 € per person

Local Organizers	**Co-Organizer**
Andrej Anžlin, Maja Kreslin, Mirko Kosič, Doron Hekič and Aleš Žnidarič Slovenian National Building and Civil Engineering Institute Department of Structures Section for Bridges and Other Civil Engineering Structures Ljubljana, Slovenia	**Irina Stipanovic** *University of Twente,* *Faculty of Engineering Technology, Enschede, Netherlands*

Learn from renowned lecturers:

- Dr. Irina Stipanovic, University of Twente (Decision-making framework for BMS)
- Dr. Aleš Žnidarič, Director of ZAG, with ZAG “bridge” team Dr. Andrej Anžlin, Dr. Mirko Kosič, Dr. Maja Kreslin and Doron Hekič (bridge assessment using SHM data considering traffic, seismic and flood hazard, B-WIM)
- Asst. Prof. Dr. Matevž Dolenc, University of Ljubljana (Digitalization in built environment)
- Asst. Prof. Luke Prendergast, University of Nottingham (Scour of bridges)
- Prof. Dr. Tatjana Isaković, University of Ljubljana (Seismic design of bridges)
- Asst. Prof. Dr. Ivan Duvnjak, University of Zagreb (monitoring of bridges)
- Asst. Prof. Dr. Mariano Zanini, University of Padova (Multi hazard approach)

In the upcoming training program, participants will be strategically divided into various work groups, each consisting of a diverse mix of individuals. The aim is to promote collaborative learning and foster a spirit of teamwork. These groups will be entrusted with real-world case studies to work on, which are chosen from a wide range of potential scenarios, providing a comprehensive view of the issues encountered in a practical environment.

The program will culminate on the last day with an interactive presentation session. Every group will get an opportunity to present their findings, interpretations, and solutions to their peers, trainers. This will not only foster a knowledge-sharing environment but also help participants refine their public speaking and presentation skills.

In this way, this training program is not just about theoretical learning, but it emphasizes practical skills and real-world application, equipping trainees with the knowledge, skills, and confidence to tackle real-world challenges effectively.

2. PROGRAMME

Please be aware that all times referenced herein are based on Central European Summer Time.

DAY #0 | BREAKING THE ICE

Tuesday, October 10th, 2023 | Building virtual connection	
10:00 – 11:00	*Let's Get Acquainted Online: virtual meeting of all trainees, Deploy information on technical requirements (software installment)*

DAY #1

Tuesday, October 17th, 2023 | Expert Insight on Bridge Management	
08:30 – 09:00	*Registration*
09:00 – 09:15	Introduction and welcoming, Detailed program, Learning outcomes *by Andrej Anžlin from ZAG*
09:15 – 10:15	Decision making for efficient bridge life cycle management. *by Irina Stipanović from University of Twente*
10:15 – 11:00	Slovene practice on bridge inspection: classical vs digital *by Maja Kreslin from ZAG*
11:00 – 11:30	***Coffee break***
11:30 – 12:30	ZAG's experience in SHM and B-WIM *by Aleš Žnidarič from ZAG*
12:30 – 13:30	**Lunch break**
13:30 – 14:00	*Establishment of work groups and assignment of tasks* *by trainers from ZAG*
14:00 – 17:00	**Site visit:** Bridge inspection and SHM living lab

DAY #2

Wednesday, October 18th, 2023 | Digital construction, Weigh-in-motion Tech, Resilient Infrastructure	
09:00 – 10:00	Scour assessment of bridges using online and offline monitoring by Luke Prendergast from University of Nottingham
10:00 – 11:00	*Beyond B-WIM: Practical applications of data gathered by bridge WIM systems* by Matija Mavrič from Cestel d.o.o.
11:00 – 11:30	**Coffee break**
11:30 – 12:30	Digitalisation of the built environment *by Matevž Dolenc from University of Ljubljana*
12:45 – 14:00	***Lunch break***
14:00 – 17:00	*Distribution of case study materials* *Work on FE modelling, manual model updating, analysis of SHM data* *by trainers from ZAG*

DAY #3

Thursday, October 19th, 2023 | Design and Monitoring	
09:00 – 10:00	The second generation of Eurocode 8 standard with an emphasis on the second part for the seismic design of bridges. *by Tatjana Isaković from University of Ljubljana*
10:00 – 11:00	Numerical modelling of existing bridges exposed to seismic and flooding events by Mirko Kosič from ZAG
11:00 – 11:30	***Coffee break***
11:30 – 13:30	Analysis of SHM data with Dewesoft & Python software *by Doron Hekič* *Manual model updating using SHM data (strain vs acc. Based) by trainers from ZAG*
13:30 – 14:30	**Lunch break**
14:30 – 15:30	*SHM during construction phases and load testing of Peljašac bridge* *by Ivan Duvnjak from University of Zagreb*
15:30 – 16:30	*Manual model updating using SHM data (strain vs acceleration based)* *by trainers from ZAG*
16:30 – 18:00	Preparation of workgroup reports and presentations *by Trainees*
19.00 –	Dinner hosted by Cestel

DAY #4

Friday, October 20th, 2023 | Synthesis, Presentation and Celebration Hike	
09:00 – 10:00	Multilevel approach in assessing safety of bridges considering traffic loads, earthquakes, landslides and floods by Mariano Zanini from University of Padova
10:00 – 11:00	Preparation of workgroup report & discussion *by Trainees and Trainers*
11:00 – 11:30	*Coffee Break*
11:30 – 12:30	Workgroup presentations, summary, and conclusions *by Trainees + Trainers*
12:30 – 16:00	***Nearby scenic hike with lunch** to celebrate your successful completion of EUROSTRUCT training school and honor your hard work and achievements.*

Trainees are required to submit a written report summarizing their key takeaways from the training session within seven days of its completion. The report should be no more than 10 pages long and cover all topics from the training. The deadline for submission is 27th of October 2023.


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