

*1st European Conference of the European
Association on Quality Control
of Bridges and Structures*

EUROSTRUCT 2021

www.eurostruct.org/eurostruct-2021



EUROSTRUCT



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1. PRESENTATION

From 29th August to 1st September 2021 the 1st European Conference EUROSTRUCT (European Association on Quality Control of Bridges and Structures, www.eurostruct.org) will take place in Padua. EUROSTRUCT was created with the aim of promoting, encouraging and disseminating at European level the culture of quality control of bridges and structures, promoting international cooperation and the sharing of experience in the field of structural monitoring and maintenance management of infrastructure and building assets, and analyzing the safety of facilities against ordinary and extreme actions, both natural and man-made. New methodologies and technologies for the retrofit of existing bridges and buildings with the use of sustainable solutions will also be discussed during the meeting. EUROSTRUCT brings together researchers from various academic institutions, engineers and professionals working in the field of structural design and management of bridges and viaducts, owners, and companies operating in the field of civil engineering. Particular emphasis will be given during the EUROSTRUCT Conference to issues related to structural reliability, robustness, resilience, and risk considering also the interaction with degradation phenomena for bridges and infrastructures. Sessions of the conference will also discuss economic aspects related to planning and optimization of interventions in the context of virtuous practices of Asset Management. The conference, thanks to its international targeting, will provide participants with a complete overview of the methodologies and the technological advances currently in use worldwide and will promote these exchanges thanks to a series of social events.

The Organizing Committee Chairs



2. MAIN TOPICS

OBJECTIVES

- *Increase knowledge of existing bridges and structures;*
- *Discuss the topics of structural reliability, robustness, risk and resilience for existing bridges and structures;*
- *Propose new methodologies and technologies for improving quality and sustainability of existing bridges and structures;*
- *Support different stakeholders through the use of advanced tools on their decision process*

THEMES

- *Testing and advanced diagnostic techniques for damage detection in existing bridges and structures;*
- *Structural Health Monitoring and AI, IoT and Machine Learning for data analysis of existing bridges and structures;*
- *Fiber optics and smart sensors for long-term SHM of existing bridges and structures;*
- *Structural reliability, risk, robustness, redundancy and resilience for existing bridges and structures;*
- *Corrosion models, fatigue analysis and impact of natural and man-made hazards on infrastructure components of existing bridges and structures;*
- *Bridge and Asset Management Systems, and decision-making models of existing bridges and structures;*
- *Life-Cycle Analysis, retrofit and service-life extension, Risk Management Protocols of existing bridges and structures;*
- *Quality Control Plans, sustainability, green materials of existing bridges and structures.*



3. COMMITTEES

ORGANIZING COMMITTEE

- Carlo Pellegrino, University of Padua, Italy
- Flora Faleschini, University of Padua, Italy
- Mariano Angelo Zanini, University of Padua, Italy
- José C. Matos, University of Minho, Portugal
- Alfred Strauss, University of Natural Resources and Life Sciences (BOKU), Austria
- Joan R. Casas, Technical University of Catalonia – BARCELONATECH, Spain

SCIENTIFIC COMMITTEE

- Carlo Pellegrino, University of Padua, Italy
- Flora Faleschini, University of Padua, Italy
- Mariano Angelo Zanini, University of Padua, Italy
- José C. Matos, University of Minho, Portugal
- Joan R. Casas, Technical University of Catalonia – BARCELONATECH, Spain
- Alfred Strauss, University of Natural Resources and Life Sciences (BOKU), Austria
- Achille Paolone, Sapienza Università di Roma, Italy
- Amir Kedar, Kedmor Engineers Ltd., Israel
- Andrea Dall'Asta, Università di Camerino, Italy
- Anton Syrkov, Transmost, Russia
- Bruno Briseghella, Fuzhou University, China
- Carmelo Gentile, Politecnico di Milano, Italy
- Carmelo Majorana, University of Padua, Italy
- Dan Frangopol, Lehigh University, USA
- Daniele Zonta, University of Trento, Italy
- Elena Dumova-Jovanoska, University of Skopje, Republic of North Macedonia
- Eleni Chatzi, ETH Zürich, Switzerland
- Fabio Biondini, Politecnico di Milano, Italy
- Fabrizio Paolacci, Roma Tre University
- Fausto Minelli, University of Brescia, Italy
- Filippo Ubertini, University of Perugia, Italy
- Gianfranco De Matteis, University of Campania Luigi Vanvitelli, Italy
- Giovanni Fabbrocino, University of Molise, Italy
- Giuseppe Andrea Ferro, Politecnico di Torino, Italy
- Giuseppe Ricciardi, University of Messina, Italy
- Gudmundur Valur Gudmundsson, Icelandic Road and Coastal Administration, Iceland
- Guido De Roeck, KU Leuven, Belgium
- Irina Stipanović, University of Twente, The Netherlands
- Jan Bieñ, Faculty of Civil Engineering, Poland
- Marco Savoia, University of Bologna, Italy
- Maria Pina Limongelli, Politecnico di Milano, Italy
- Paolo Clemente, ENEA, Italy
- Paolo Gardoni, University of Illinois-Champaign, USA
- Paulo B. Lourenço, University of Minho, Portugal
- Rade Hajdin, Faculty of Civil Engineering, Serbia
- Ravindra Gettu, Indian Institute of Technology Madras, India
- Ruben Paul Borg, University of Malta, Malta
- Sérgio Fernandes, ANSER Lda., Portugal
- Theodoros Rousakis, Democritus University of Thrace, Greece
- Túlio N. Bittencourt, Polytechnic School at the University of São Paulo, Brazil
- Vikram Pakrashi, University College Dublin, Ireland
- Walter Salvatore, University of Pisa, Italy
- Yiannis Tsompanakis, Technical University of Crete, Greece
- Yiannis Xenidis, Aristotle University of Thessaloniki, Greece

TECHNICAL SECRETARIAT AND LOCAL ORGANIZERS

- Filippo Andreose, University of Padua, Italy
- Sergio Belluco, University of Padua, Italy
- Gianantonio Feltrin, University of Padua, Italy
- Giovanni Gobbi, University of Padua, Italy
- Lorenzo Hofer, University of Padua, Italy
- Silvia Manarin, University of Padua, Italy
- Riccardo Piazzon, University of Padua, Italy
- Lucia Sambataro, University of Padua, Italy
- Davide Santinon, University of Padua, Italy
- Paolo Zampieri, University of Padua, Italy



4. EUROSTRUCT ASSOCIATION

EuroStruct emerged from COST Action TU146 "Quality specifications for roadway bridges, standardization at a European level (BridgeSpec)", which aimed to achieve the European economic and societal needs by standardizing the condition assessment and maintenance level of roadway bridges.

With a duration of only 4 years, it was found that the work carried out during COST Action TU1406 could still be further developed and its purpose could be extended to structures other than road bridges. With this in mind, it was decided to create the EuroStruct Association which aims to promote the understanding and advancement of practice on quality control of bridges and structures at a European level.

Such desideratum can be achieved by:

- improving the quality of bridges and structures in Europe;
- promoting worldwide cooperation and understanding through the exchange of knowledge and experience in quality control;
- encouraging awareness and responsibility of structural engineers towards the needs of society;

- encouraging actions necessary for progress of quality control in bridges and structures;
- improving and fostering cooperation and understanding between organisations with similar objectives.

In order to fulfil its mission and objectives, the Association will organise meetings, seminars, conferences and related activities independently or in collaboration with other organisations. The Association intends to collaborate with other organizations and institutions with objectives consistent with its own.

The Association also intends to publish reports, communications, periodicals, books, amongst others, identify research and development needs, and initiate and support research activities.



EUROSTRUCT

5. ABOUT UNIPD

The University of Padua is one of Europe's oldest and most prestigious seats of learning. As a multi-disciplinary institute of higher education, the University aims to provide its students with professional training and a solid cultural background. The qualification received from the University of Padua act as a symbol of the ambitious objectives respected and coveted by both students and employers alike.

Founded in 1222, Padua's Studium Patavinum was a place of study that readily welcomed Italian students and scholars, as well as those from various European countries searching for cultural freedom and expression. This freedom continues to define and express the essence of the University through its motto as *Univ[er]sa univ[er]sis patavina libertas*. Intertwined within the story of the University of Padua are the many illustrious figures who lived, studied and taught in this city. Such famous names included those who have changed the cultural and scientific history of humanity, from Copernicus to Vesalius, Galileo, to William Harvey, to the more modern *Tullio Levi-Civita*, *Concetto Marchesi*, *Giuseppe 'Bepi' Colombo* and many others.

The University of Padua has been a proud pioneer of several endeavours, including the first university botanical garden in the world founded in 1545 that now holds its status as a UNESCO World Heritage Site. In

1594, the first permanent anatomical theatre was inaugurated, and in 1678, *Elena Lucrezia Cornaro* becomes the first woman in the world to receive a Doctor of Philosophy degree.

Still today, the University of Padua holds some impressive numbers. With over 65,000 students and 2,200 educators within its 32 departments, the University also employs over 2,300 technical administrators. Accrediting more than 13,000 graduates each year, awarding 5,000 scholarships, and brandishing over 2 million books available throughout its 29 libraries. The University continues to transform its level of excellence in education by offering a vast range of degree programs. Including over 100 bachelor and master degree programs, 10 single-cycle degree programs, almost 100 master degree programs, more than 20 advanced programs, and over 10 specialized training courses. The University includes over 60 specialization schools and 40 PhD schools.



UNIVERSITÀ
DEGLI STUDI
DI PADOVA

6. VENUE



Hotel Best Western Galileo

The Eurostruct2021 conference will be held at the **Hotel Best Western Galileo** in Padova, an elegant 4 stars hotel located near the center of Padova. All the most interesting and evocative city sites are within a short walking distance. Starting from the Hotel you can visit the city center, the Scrovegni Chapel painted by Giotto, the Astronomical observatory of Galileo and much more.

Services provided:

FREE GARAGE: large free garage at your disposal;

CONGRESS CENTER: rooms equipped for meetings up to 200 people;

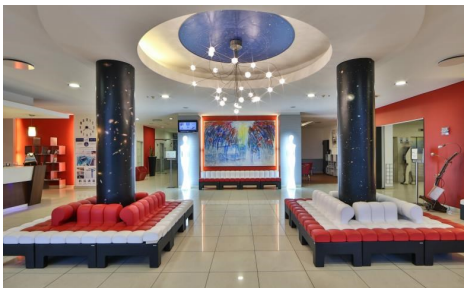
SPECIAL PROTECTION PROGRAMME: A prevention programme to prevent the spread of the corona virus.

A relaxing and pleasant stay at the Best Western Premier Hotel Galileo Padova will be guaranteed by the comfortable 113 double / double single rooms.

The Congress Centre "Giove" is equipped with meeting rooms with modular development to fulfill any request for meetings or business meetings. On the hotel website, <https://www.hotelgalileopadova.it>, in the section "Meeting Center", you can see in detail the conference offer.

The Restaurant Department has been entrusted to a young, innovative and creative Group that is capable to ensure the best quality and the best service. Inside the hotel there is a fined bar, suitable for coffee breaks and aperitifs.

Important information: to ensure a Covid-free event EU Greenpass is mandatory to access to the Conference, according to the Italian guidelines. Further, Covid tests will be provided during the event.



Hotel Best Western Galileo



Exhibition Area

EUROSTRUCT 2021

www.eurostruct.org/eurostruct-2021



Luna Meeting Room



Europa Meeting Room



Ganimede Meeting Room



Panorama Meeting Room



7. GENERAL PROGRAMME

Sunday 29/08

From 16.45 **Registration and testing**

19.30 **Welcome Reception** at the Hotel's Restaurant

Monday 30/08

From 8.00 **Registration and testing**

9.00-9.30 **Opening Ceremony** with Academic Authorities and Organizing Committee

9.30.00-10.30 **Session 1**

10.30-11.00 **Coffee Break**

11.00-12.30 **Session 2**

12.30-14.00 **Lunch**

14.00-14.45 **Keynote Lecture**

14.45-16.15 **Session 3**

16.15-16.45 **Coffee Break**

16.45-18.15 **Session 4**

19.30-21.30 **Social Event**: Private Guided Tour of the University of Padua Botanical Garden

Tuesday 31/08

8.00-9.45 **Registration and testing**

9.45-10.30 **Keynote Lecture**

10.30-11.00 **Coffee Break**

11.00-12.30 **Session 5**

12.30-14.00 **Lunch**

14.00-14.45 **Keynote Lecture**

14.45-16.15 **Session 6**

16.15-16.45 **Coffee Break**

16.45-18.15 **Session 7**

18.15-19.15 **General Assembly** (EuroStruct Members only)

20.00-24.00 **Gala Dinner**

Wednesday 01/09

8.00-9.45 **Registration and testing**

9.45-10.30 **Keynote Lecture**

10.30-11.00 **Coffee Break**

11.00-12.30 **Session 8**

12.30-13.30 **Closing Ceremony** with awards

13.30-15.00 **Lunch**

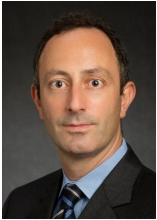
From 15.00 **Technical Tour** : FIPMEC headquarters



8. KEYNOTE LECTURES

Monday, 30/08

14.00-14.45



An Overview of Regional Risk and Resilience Analysis

Prof. Paolo Gardoni

University of Illinois at Urbana-Champaign, USA

Tuesday, 31/08

9.45-10.30



Distributed optical fiber sensors in Structural Health Monitoring

Prof. Joan Ramon Casas

Technical University of Catalunya, Spain

Tuesday, 31/08

14.00-14.45



Risk, Resilience and Sustainability of Civil Infrastructure Systems under Lifetime Hazards in a Life-Cycle Optimization Framework

Prof. Dan M. Frangopol

Lehigh University, USA

Wednesday, 02/09

9.45-10.30



Application of new Italian guidelines on existing bridges: first results and open problems

Prof. Walter Salvatore

University of Pisa, Italy



9. ABOUT PADOVA

Padova claims to be the oldest city in northern Italy, since it was founded according to Virgil's Aeneid in 1183 BC by the Trojan prince Antenor. The city is picturesque, with a dense network of arcades streets opening into large squares, and many ancient bridges and walls close to the Bacchiglione river.

A city definable as truly student-friendly, Padua hosts over 60,000 students within a population of little more than 210,000 inhabitants: these are the numbers depicting one of the oldest university towns, where student and city life coexist in close proximity on a daily basis. The student-filled piazzas, the open air of the river banks enjoyed by joggers, a summer aperitif on the Piovego waterfront, not to mention an abundance of cultural, musical and sporting events... all features of a vibrant and welcoming city where students can spend time in places full of history, art and beauty, like the Botanical Garden where they can go free of charge. Many different languages can be heard when walking around the city streets, not least as a result of the continuous flow of international tourists.

Padua is also well-endowed with parks, green spaces and bicycle lanes (currently 170 km), allowing students to get from A to B quickly and easily, every day. And if the need arises, there is also a car-sharing scheme available, with 28 docking stations. Similarly, people keen on sports are well catered for, with the University Sports Centre (CUS) offering a wide range of activities, individual and team alike.

There are always plenty of opportunities to hear good music, and many of the shops in the city accept the Studiare a Padua Card, which entitles university students and employees to price discounts.

More and more initiatives are being introduced for low price admission to theatres and concert halls with Zed, including shows at the Gran Teatro Geox, subscriptions and special price tickets for the Teatro

Verdi, and admission free of charge to events staged by RadioBue.it, the University's web radio station.

A traditional dialect rhyme describes Padua as having a meadow without grass, a saint without a name and a café without doors.

The meadow without grass is Prato della Valle, one of Europe's largest squares. The current configuration of Prato della Valle dates from 1775 when a marshy area was reclaimed. At the centre is a large elliptical island surrounded by a canal and decorated with 78 statues of famous people associated with Padua. People go there to practise sports and on Saturday it is transformed into an evocative market.

The saint without a name refers to the basilica dedicated to Saint Anthony, known by the city's inhabitants simply as "il Santo" (the Saint). Built in the 13th century, it contains numerous works of inestimable artistic value. Its silhouette, with oriental style bell towers, stands out majestically against the sky, a characteristic feature of the city's horizon.

The café without doors is the Caffè Pedrocchi, built in 1826 to a design by Jappelli. It was described as without doors as it represented a "refuge" ever ready to welcome travellers and intellectuals. A place to meet and talk, it is animated by concerts, exhibitions and conferences. But the city goes on and on, in squares and corners which tell its history, in historic buildings which reveal its art, in streets which year after year welcome students and accompany them during their stay.



The Astronomical clock in "Piazza dei Signori"



The Scrovegni Chapel



Basilica of Saint Anthony of Padua



La Specola tower

10. SOCIAL EVENTS

Social Event #1 – The University of Padua Botanical Garden

Date: Monday 30th August 19.30-21.30

Duration: 1h and a half with private guide

Cost: 8€/person for groups of 25 people (for smaller groups depends on the number of reservation)

Deadline Reservation: August 27h

Additional Info: It is mandatory to wear masks during the visit, also in outdoor spaces. EU Greenpass is mandatory.



The Botanical Garden

Created in 1545 on the property of the Benedictine monks of St. Justina, Padua Botanical Garden is the oldest existing university botanical garden in the world. The Senate of the Venetian Republic approved its foundation for the cultivation of medicinal plants, which later constituted the largest portion of the so-called “simple” herbs, i.e. medicaments of natural origin. This is why early botanical gardens were called Horti simplicium (“Gardens of Simples”).

In ancient times the identification of medicinal plants by botanists was uncertain, and frequently led to mistakes and even frauds, which caused great damage to people’s health. The institution of a Horto medicinale, prompted by Francesco Bonafede, who held the chair of “Lecturer of Simples”, enabled students to identify true medicinal plants. The first “custodian” of the Garden, Luigi Squalermo, called Anguillara, introduced and cultivated a large number of species (1,800). In spite of severe punishments (fines, imprisonment, exile), the Garden was often targeted by thieves, who stole many rare plants, due to the large profits that could be obtained from them. A circular enclosing wall was soon built (hence the names Hortus sphaericus, Hortus cinctus, and Hortus conclusus). The Garden was constantly enriched with plants from all

over the world, particularly from countries where the Venetian Republic had possessions, or with which it traded. This is why Padua played such an essential role in the introduction and study of several exotic species.

The Garden has witnessed the evolution of botany from a science originally applied to medicine, to an independent science with various branches. The library, the herbarium, and several laboratories, were later added. Just like other similar university institutions in Italy and abroad, not only does the Botanical Garden provide an opportunity for the general public to learn more about plants, but it is also a resource for scholars, and it aims at preserving rare and endangered plant species.

Padua Botanical Garden is the original of all botanical gardens throughout the world; it represents the birth of science, of scientific exchanges, and of the awareness of the relationship between nature and culture. It gave a great contribution to the development of many modern scientific disciplines, notably botany, medicine, chemistry, ecology, and pharmacy.



Social Event #2 – The Scrovegni Chapel + Eremitani Palace

Date: Tuesday 31st August

Duration: 30 minutes

Cost: 10-14€ depend on the number of partecipants. It includes entrance to the Eremitani Museum and the Zuckermann Palace

Deadline Reservation: August 27h

Additional Info: It is mandatory to wear masks during the visit. EU Greenpass is mandatory.



The Scrovegni Chapel

The Scrovegni Chapel, dedicated to St. Mary of the Charity, frescoed between 1303 and 1305 by Giotto, upon the commission of Enrico degli Scrovegni, is one of the most important masterpieces of Western art. The frescoes, which narrate events in the lives of the Virgin Mary and Christ, cover the entire walls. On the wall opposite the altar is the grandiose Universal Judgement, which concludes the story of human salvation.

The chapel was originally attached to the Scrovegni family palace, built after 1300, following the elliptical outline of the remains of the Roman arena.

The Chapel was acquired by the City of Padova in 1880, and the vulnerable frescoes were subjected to several specialized restoration operations during the 19th and 20th centuries. From the 1970s until today, thanks to close collaboration between the city administration, cultural heritage authorities and the "Istituto Centrale per il Restauro",

the state of the building, the quality of the air in it, polluting factors, and the state of conservation of the frescoes themselves have all been subjected to careful study and monitoring. The addition of the new access building, with its special air-conditioned waiting-room, means that even great influxes of visitors can enter the Chapel and admire Giotto's masterpiece without further jeopardizing its fragile condition in any way.

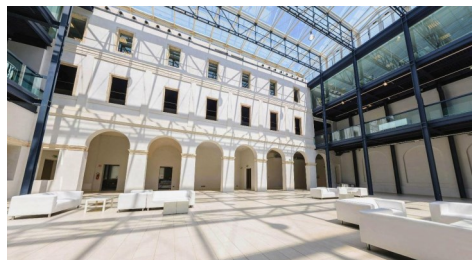
The latest checks, which show that the condition of the frescoes is now stable, have allowed them to be restored further – delicate operations undertaken by the "Istituto Centrale per il Restauro" – thanks to an agreement between the City of Padova and the "Italian Ministero per i Beni e le Attività Culturali".

From July, 2021, the Scrovegni Chapel is included on UNESCO's list of World Heritage sites, in the Padua's fourteenth-century fresco cycles.

Gala Dinner

The Gala Dinner will be held on Tuesday 31st of August at the Cultural Centre "Altinate", which is an historical building recently renewed and it is located in Padua. Originally, it was a Theatine monastery (from Sain Gaetano Thiene) designed by Vincenzo Scamozzi around 1582. Later on, at the beginning of the nineteenth century, the Monastery was bought by the Municipality and turned in a Courthouse. Finally, due to a deep renovation process started in 2008, the building has become a cultural reference place in town.

Important information: EU Greenpass is mandatory.



Cultural Centre Altinate



11. TECHNICAL TOUR

FIP MEC S.r.l. headquarters

Date: Wednesday 1st September from 3:00 p.m.

Duration: 2.00 hours

Cost: free and reserved for the first 30 reservations.

Deadline Reservation: August 25th by sending an email to eurostruct2021@dicea.unipd.it

Additional Info: It is mandatory to wear masks during the visit, also in outdoor spaces. EU Greenpass is mandatory.



FIP MEC headquarters

With over 60 years-uninterrupted design and manufacture of bridge bearings and expansion joints, FIP MEC S.r.l. is a Leader in its sector. They produce seismic devices for any structure, from bridges to residential buildings, hospitals, critical structures, oil and gas. The products of which they are manufacturers include: insulators, heatsinks, shock Transmitters and other technologies

FIP MEC S.r.l. has its headquarters in Selvazzano Dentro, in the province of Padua (Italy), where it occupies an area of approximately 51,000 square meters and is currently present in over 40 countries worldwide.

The experience of the designers of FIP allows them to collaborate in the construction of exceptional works: an example is the longest bridge in the world, such as Channakale bridge Turkey, Izmit bridge Turkey, Storebaelt bridge Denmark, Stonecutters bridge Hong Kong.

The technical tour inside the headquarters of Selvazzano Dentro (PD) is an opportunity to see up close this important Italian reality. The event will be organized in two moments, both of 15 minutes.

15 minutes will be dedicated to the visit of the plant and 15 minutes will be dedicated to a visit to the laboratories of the company; In these times will be shown the technological findings in elaboration by FIP in the field of insulation and seismic protection of new buildings and in the existing built heritage, with particular attention to products dedicated to bridges and road infrastructure. The technical excursion will be free and reserved for the first 30 guests who will book, subject to availability, by sending an email to eurostruct2021@dicea.unipd.it.

The departure will be from the Hotel Galileo.



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12. EUROSTRUCT AWARDS

The EUROSTRUCT Award is established by the EUROSTRUCT -Executive Committee to honour outstanding contributions to bridge and structural asset management and structural engineering.

This award will be made to the member of the EUROSTRUCT Association whose work has helped in significantly strengthening the scientific base of structural asset management including quality control, assessment and management of bridges and structures. The work may consist of articles in journals, conference papers, professional achievements or other sources which addressed the issues of structural safety, maintenance, infrastructure, asset management and life-cycle cost.

Nominations for the EUROSTRUCT Award to be presented at the EUROSTRUCT 2021 Conference have to be sent to the EUROSTRUCT Award Committee at :

https://docs.google.com/forms/d/e/1FAIpQLSeqRXZW_DuCTOCvTL4nKLR7k50ZsoJouegC8DuEwjyJk1Yg1w/viewform?vc=0&c=0&w=1&flr=0

Nominations must be received by August 23, 2021. In each nomination, please include a short biography of the nominee including current position, past achievements and qualifications for this award.

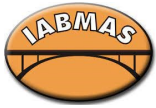
EUROSTRUCT SENIOR AND YOUNG AWARDS

Senior Award (nominees must have been 31 years of age or older on January 1, 2021).

Young Award (nominees must have been 30 years of age or younger on January 1, 2021).



13. SUPPORTING ASSOCIATIONS



*Consiglio Superiore
dei Lavori Pubblici*



PATROCINIO
REGIONE DEL VENETO



Provincia di Padova



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14. SPONSORS

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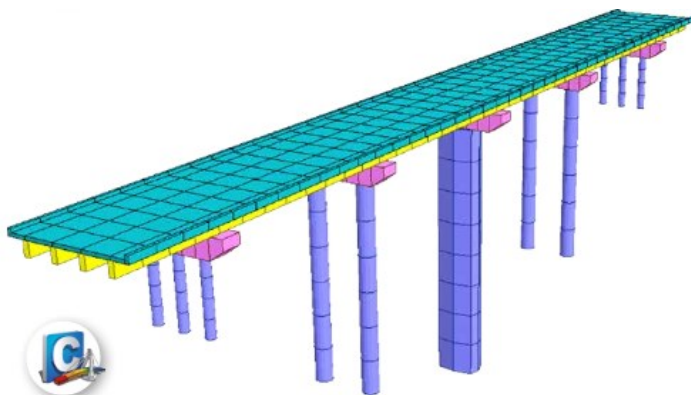
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CSPFea is an Italian company that offers services to professionals and companies of Engineering and Architecture, providing software tools for numerical simulation, basic training and support on customer's project. In particular, the training activity covers different sectors and themes of the AEC world, including: structures and infrastructure (new and existing), BIM and InfraBIM, seismic, hydrogeological risk.

CSPFea's mission is to assist engineering companies, professionals and companies engaged in the vast sector of civil engineering, architecture and construction (AEC), helping them to improve processes and methods, analysis and design capabilities through simulation: we are your partners to increase your performance, improve the design process and the reliability of your services. "Reliable seismic design", "Construction simulation", "Interoperability" are some of the paradigms in which we believe with professionalism, enthusiasm, passion, always in first line of Computer Aided Engineering (CAE), CAD, BIM, collaborating with some of the most prestigious R&D institutions worldwide. We explain to our customers how to integrate the best software solutions in the Computer-Aided-Engineering (CAE) sector in order to add value to every step of the design and construction process; this often means tailoring the customer's solutions starting from the software applications on which the customer has built his own capabilities and reputation.





MOVYON is a leading company in the development and integration of Intelligent Transport Systems solutions, created as the centre of excellence in research and innovation of Autostrade per l'Italia.

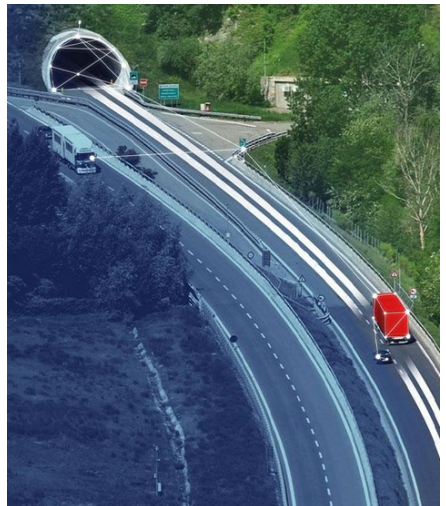
We design, integrate and produce innovative solutions to design the future of mobility, which for us is already intelligent and sustainable today, powered by a technology which is invisible but always there.

We develop systems aimed at monitoring and managing infrastructures, for the control and management of road travel and safety, for tolling, for smart cities and roads. WE operate in Italy and abroad. Our solutions are targeted to public administration offices, managers of distributed infrastructures, to large companies and to service providers, supporting them in the offer of restyled services and mobility experiences which are more user-friendly and secure. Our approach is open-minded and cooperative. We work with universities, research centres, incubators and start-ups, leveraging on open innovation and co-creation.

MOVYON is part of the Group Autostrade per l'Italia, the company which in our country manages over 3,000 km of motorway infrastructures, over four million users. The company has a transformation plan whose industrial concept is based on research and innovation applied to engineering, on sustainability as centre for value creation, on the operation and maintenance of mobility infrastructures. The objective of the Group is to strongly quality the standards and activities of the motorway licensee,

and – at the same time – to open new frontiers for business in the area of engineering, innovation and smart systems for urban mobility. We work in close contact with start-ups, research centres, universities at domestic and international level. We bring together the best competences to develop solutions aimed at making our customers' operating processes more efficient, and to design new functionalities which will allow us to offer users safer, more accessible and sustainable mobility. We support our clients to provide drivers with a new travelling experience. Our goal is to create a safer, more accessible, sustainable mobility finding solutions to simplify our customers' operational processes.

MOVYON is the catalyst for technological innovation of the Autostrade per l'Italia Group. It promotes and develops initiatives which are implemented on motorways and other infrastructures for suburban mobility, as well as in urban settings, helping get closer to the concept of smart city. The mindset and methods used by the company are very similar to those of startups. The approach is based on the Venture Capital concept: resources are allocated as the technological maturity of the initiative increases and the idea becomes more concrete. This open innovation approach thus also includes partnerships. The R&D team works in close contact with innovation hubs, universities and research centres, selecting the most skilled human resources at international level.





osmos

STRUCTURAL HEALTH MONITORING

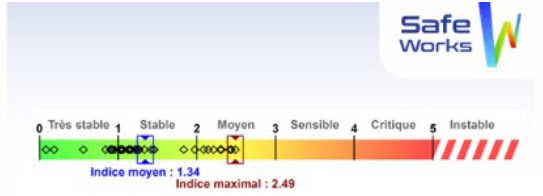
A subsidiary of Eren Group, an expert in natural resource efficiency, OSMOS aims to extend the lifespan of structures by optimizing their upkeep, in order to save energy and economize on the materials needed for new builds. With recognized expertise in France and abroad, the company has made a name for itself as a major player on the structural health monitoring (SHM) market. Thanks to its innovative technology and its expertise, OSMOS gives managers of structures and engineering and construction companies the possibility of continuously monitoring changes to their structures, in real time.

The State, regional authorities and private transit companies that are responsible for bridge management and maintenance are faced with a scenario of aging assets. The accelerated deterioration of the structural health of bridges has, in some cases, led to costly closures to traffic that affect user movements. Given these challenges, OSMOS's solutions remain the most reliable on the market for continuous monitoring. Our systems go beyond traditional sounding techniques, which are often limited to periodic inspections and/or physical/chemical (non-mechanical) assessments.

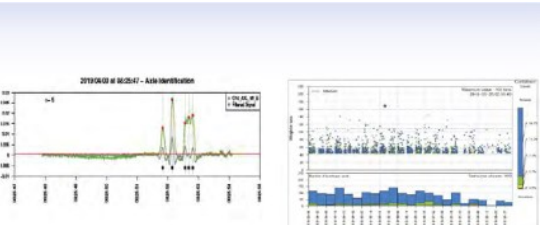
Engineering works today are subject to periodic visual inspections to monitor their structural health and their changes over time. However, this method of assessment only identifies visible damage. Monitoring offers the advantages of being precise and non-intrusive and of functioning continuously. It provides direct access to essential quantitative information about structures' actual mechanical behavior and the impact on their operation. For managers, this is an extremely helpful tool for asset management.

OSMOS solutions respond to the challenges associated with aging infrastructure thanks to the early detection of pathologies and/or structural risks. The information derived from our services are of precious help in improving bridge management and upkeep. By redefining maintenance operations and targeted repairs, based on the points of fragility identified in each structure, managers can optimize the use of their budgets and avoid closures that may be unnecessary and that are terribly costly and restrictive for users.

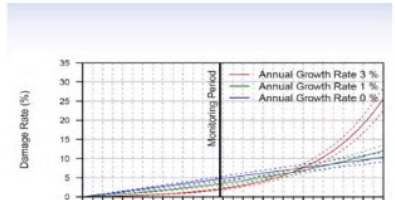
Stability control



Overload control



Fatigue control



EUROSTRUCT 2021

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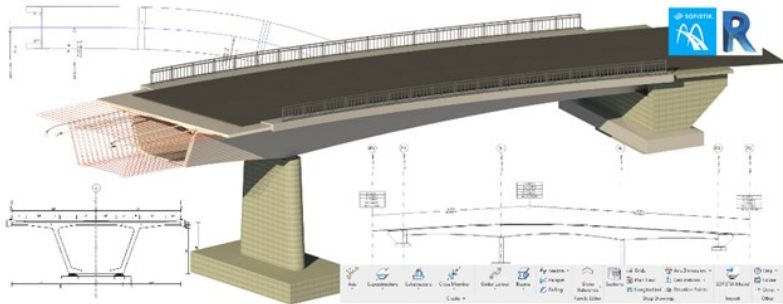
venmises
ideal solution



SOFISTIK



SOFISTIK AG is Europe's leading manufacturer of construction software for analysis, design, and detailing. In addition to the traditional fields of FEM analysis and CAD, SOFISTIK focuses on the digitization of construction processes and BIM solutions. Collaboration across all the disciplines and transparency in every project phase, these are the objectives behind every new SOFISTIK product and every release. This is how SOFISTIK provides its customers the enormous boost in efficiency that digitization has to offer the construction industry. After 30+ years developing high-end solution for civil engineering and construction industry, collaborating with partners and research/academic institutes in many countries, member of several international associations, with thousands of



Venmises is providing SOFISTIK software, training, consulting and technical support in Italy and other country.



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60 years-uninterrupted design and manufacture of bridge bearings and expansion joints. Seismic devices for any structure, from bridges to residential buildings, hospitals, critical structures, oil and gas. Decades of quality certifications and mindset, of real-scale testing and reliability. Most powerful laboratory in Europe and among the first in the world, operating under supervision of Third Parties -Padova University, Milan Polytechnic University and world's top designers. Tests at independent laboratories, including at Caltrans Testing Facility in San Diego, USA. Technical partner with academia and industry in EU and international research programmes. Small structures as well as world longest bridges (Channakale bridge Turkey, Izmit bridge Turkey, Storebaelt bridge Denmark, Stonecutters bridge Hong Kong, just to mention a few). Real earthquakes (e.g. Somplago bridge, Italy: Friuli 1976 -Rion Antirion bridge, Greece: Achaia-Elia 2008 -Taipei 101, Taiwan: typhoons and earthquakes since 2005). After L'Aquila 2009, thousands of isolators for the CASE project and for numerous other new or existing buildings. Monitoring and maintenance service for bridges and buildings.



G&P INTECH is a Venetian company certified ISO 9001 by the English notified body SGS with thirty years of experience in innovative products and technologies of high professional standard and competitiveness for the construction sector, infrastructure, of recovery and seismic. Infrastructures and seismic products. The most important products developed by G&P Intech are retrofit system through composites materials (FRP, FRCM, CRM) certified by University and Institutional Authority, seismic dissipation system for bridges and viaducts and isolation system, active HDPE/sodium bentonite underground waterproofing, resilient, low-thickness driveway waterproofing for bridges and parking lots. All major products and technologies certified under European EC and international standards, are the result of constant research carried out in the laboratories of the group and the Italian and foreign Universities and are approved by the main public and private Procurement Stations and their technical operating structures. The company has over 25 years of activity in areas affected by violent earthquakes in Italy and abroad with university research programs and in reconstruction and seismic prevention after the earthquakes that affected Italy from 1997 to 2017 and abroad in Greece, Mexico, Ecuador, Chile. The works carried out in the A14 Adriatica viaducts, in the Della Scafa viaduct in Rome, in the San Giuliano Mestre railway overpass, in the steel revolving bridges in the province of Venice, in the RFI Montegiana railway viaducts (MN) and in the Bologna section-Rimini, in the new bridge over the Po in Piacenza, in the motorway tunnels in A1 Barberino and Impruneta.

kerakoll

Kerakoll is the first company in the world to offer a comprehensive package of green building materials and services to build healthy homes and live in harmony with the environment. Since 1968 – when the Group was founded in Sassuolo, the heart of the most important ceramic district in the world, thanks to the business initiative of Romano Sghedoni – Kerakoll has undergone a constant growth both on the national and international market for building materials that has taken the company to the forefront of the GreenBuilding sector and to a level of technological leadership recognized all over the world. Kerakoll's revenues have risen from about 11 million euros in 1990 to today's approximately 500 million euros - 45% of which on foreign markets; the Group has now around 2,000 employees and associates. As of today, Kerakoll is active in 12 countries with 16 production plants in Italy, Spain, Poland, Greece, France, the United Kingdom, India and Brazil and has recently launched a massive 175 million-euro investment plan over the next 5 years. The rapid expansion of the Group is demonstrated as well in the growth of its turnover, from around 11 million euros in 1990 to 500 million in 2019 with an employment growth of circa 1,500 people. For more information: www.kerakoll.com



OPTICS11 is an Amsterdam based high tech company that offers state-of-the-art fiber optic sensing systems for unmatched performance. We believe optical fiber sensing provides a unique solution for many applications that involve precise measurements in challenging environments. As a result light can travel unperturbed inside the fiber, and typically only glass or silicon is required for the sensing element, any environmental challenge can be championed: low or high temperature, liquids, electrical or magnetic fields and/or remote locations.

Our NovaFAZ SHM system is our FBG based measuring system and a must have when a combination of actionable data together with a long term reliable system lifetime and overall cost reduction is required. Next to this we offer world's only fiber optic Acoustic Emission system OptimAE, capable detecting ultrasonic early signs of fatigue using patented fiber technology. The underlying technologies driving our systems enables them to be more sensitive, more reliable and an overall more affordable investment compared to existing industry standards.

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15. TECHNICAL PROGRAMME

Monday 30/08/21- h. 9.30-10.30

	Room LUNA	Room EUROPA	Room GANIMEDE	Room PANORAMA
Session				
1	Damage detection in existing bridges	Structural reliability of bridges	Sensors and NDT	
Chair	Carlo Pellegrino	Josè Matos	Irina Stipanovic	
h. 9.30	Evaluation of Post Tensioned Bridges' Tendon Ducts by NDT and Minor Invasive Measures <i>Guy Rapaport</i>	Physics-based probabilistic models for the reliability analysis of bridges <i>Fabrizio Nocera, Armin Tabandeh and Paolo Gardoni</i>	Remote Sensing Measurements for the Structural Monitoring of Historical Masonry Bridges <i>Valerio Gagliardi, Luca Bianchini Ciampoli, Fabrizio D'Amico, Amir Alani, Fabio Tosti and Andrea Benedetto</i>	
h. 9.45	Ambient vibration tests of two prestressed reinforced concrete highway overpasses <i>Carlo Pellegrino, Mariano Angelo Zanini, Flora Faleschini, Filippo Andreose, Klajdi Toska, Lorenzo Hofer, Paolo Zampieri and Gianantonio Feltrin</i>	Seismic reliability assessment of an open-spandrel reinforced concrete arch bridge <i>Klajdi Toska, Mariano Angelo Zanini, Gianantonio Feltrin, Lorenzo Hofer and Carlo Pellegrino</i>	Quantification of uncertainties for geodetic observations in the context of bridge surveillance <i>Matthias Haslbeck, Thorsten Strübing and Thomas Braml</i>	
h. 10.00	Cost oriented object-related damage analysis with the Ultrasonic method for small steel bridges <i>Thomas Krausche and Hartmut Pasternak</i>	Simulation-based Life-Cycle Structural Reliability of Deteriorating RC Bridges using Bayesian Updating <i>Mehmet Yilmaz, Mattia Anghileri, Luca Capacci and Fabio Blondini</i>	Design of the data transmission component of a micrometre scale chloride ion sensor embedded inside a concrete structure <i>Stephen Sammut, Edward Gatt and Ruben Paul Borg</i>	
h. 10.15	<i>Structural Health Monitoring at the Heart of the Decision-Making Process for Structural Asset Management</i> <i>Patrice Marc Pelletier, Francois-Baptiste Cariaux and Valeria Fort</i>	Canakkale 1915 Bridge Seismic protection of the world longest suspension bridge <i>Samuele Infanti and Gian Paolo Colato</i>	BiNet: Bridge Visual inspection dataset and approach for damage detection <i>Zaharah A. Bukhsh, Andrej Anzlin and Irina Stipanovic</i>	



	Room LUNA	Room EUROPA	Room GANIMEDE	Room PANORAMA
Session 2	Structural Health Monitoring for informed management of roadway bridges: the experience of the Regione Lombardia project (special session)	Digital Twin for Monitoring	Monitoring systems and predictive models for the risk assessment of bridges (special session)	Structural Health Monitoring (special session)
Chair	Maria Pina Limongelli	Joan Casas	Francesco Morelli	Eleni Chatzi
h. 11.00	The MoRe guidelines for monitoring of transport infrastructures <i>Maria Pina Limongelli, Carmelo Gentile, Francesco Ballio, Marco Belloli, Marco Di Prisco, Fabio Biondini, Ferruccio Resta, Paola Vigo and Aldo Colombo</i>	An example of digital twins for bridge monitoring and maintenance: preliminary results <i>Chenyu Zhou, Dahai Xiao, Jianghan Hu, Yuntao Yang, Binbin Li, Simon Hu, Cristoforo Demartino and Mark Butala</i>	Autonomous IoT for Condition Monitoring, Assessment and Predictive Maintenance <i>Stefan Burtcher, Peter Huber, Stefan Wiesinger and Fritz Binder</i>	An automated machine learning-based approach for structural novelty detection based on SHM <i>Nicolas Manzini, Ndeye Mar, Franziska Schmidt, Jean-François Bercher, André Orcesi, Pierre Marchand, Julien Gazeaux and Christian Thom</i>
h. 11.15	Load testing and structural monitoring of a reinforced concrete mid-century bridge <i>Giulio Zani, Agnese Scalbi, Katherina Flores Ferreira, Claudio Somaschini and Marco Di Prisco</i>	Towards automated detection of cracked concrete <i>Aleš Žnidarič, Maja Kreslin, Andrej Anžlin, Andraž Krivic and Domen Mongus</i>	The structural risk assessment of existing bridges in Tuscany (Italy) a quick survey-based method <i>Giovanni Buratti, Antonella Cosentino, Francesco Morelli, Vincenzo Messina, Walter Salvatore, Simone Celati, Isabella Mazzatura and Domenico Gaudio</i>	Utilization of computer vision technique for automated crack detection based on UAV-taken images <i>Ali Mirzazade, Maryam Pahlavan Nodeh, Cosmin Popescu, Björn Täljsten and Thomas Blanksvärd</i>
h. 11.30	Monitoring reinforced concrete arch bridges with operational modal analysis <i>Paolo Borlenghi, Carmelo Gentile and Giacomo Zonno</i>	Monitoring of reinforced concrete structures by Distributed Optical Fiber Sensors <i>Mattia Bado and Joan Casas</i>	Assessment of the residual prestressing force in existing bridges through the X-ray diffractometer <i>Francesco Chichi, Massimo Gammino, Daniele Maestrini, Giampaolo Marconi, Francesco Morelli, Michele Mori, Ivan Panzera, Andrea Piscini and Walter Salvatore</i>	Magnetic and electromagnetic testing of suspension cables of bridges and structures <i>Dmitry Slesarev and Alexej Semenov</i>
h. 11.45	Satellite-based Structural and Hydraulic Monitoring of a 50-year-old Bridge over the Oglio River in Italy <i>Silvia Bianchi, Fabio Biondini, Manuel D'Angelo, Francesco Ballio, Mattia Anghileri, Gianpaolo Rosati and Gabriele Cazzulani</i>	Standardisation in monitoring, safety assessment and maintenance of the transport infrastructure: current status and future perspectives <i>Agnieszka Biłgaj-van Vliet, Diego Lorenzo Allaix, Jochen Köhler and Elena Scibilia</i>	Fast and Robust Structural Damage Analysis of Civil Infrastructure Using UAV Imagery <i>Alon Oring</i>	Acoustic emission and ultrasonic monitoring of a prestressed concrete bridge in its final years <i>Ernst Niederleithinger, Christian Sodeikat, Niklas Epple, Chun-Man Liao and Iris Hinderstmann</i>
h. 12.00	Structural Health Monitoring of Two Road Bridges in Como, Italy <i>Silvia Bianchi, Fabio Biondini, Gianpaolo Rosati, Mattia Anghileri, Luca Capacci, Gabriele Cazzulani and Lorenzo Benedetti</i>	KPI for bridge management. A first step for bridge digitalization <i>Felipe Collazos Arias, David Garcia-Sánchez and Álvaro Gaute-Alonso</i>	Arch Concrete Bridge Risk-Based Assessment Using a Portuguese Case Study <i>Edward Baron and Jose Matos</i>	Amplitude dependency effects in the structural identification of historic masonry buildings <i>Panagiotis Martakis, Yves Reuland and Eleni Chatzi</i>
h. 12.15	Continuous monitoring of masonry arch bridges to evaluate the scour action <i>Paolo Borlenghi, Manuel D'Angelo, Francesco Ballio and Carmelo Gentile</i>		Damage detection of post-tensioned cables in existing bridges with Digital Radiography <i>Raoul Davide Innocenzi, Giulia Pigiapoco, Sandro Carbonari, Fabrizio Gara and Luigino Dezi</i>	Innovative strengthening of road bridges with Iron-based shape Memory Alloys (Fe-SMA) <i>Jakub Vůjtěch, Pavel Ryjáček, Elyas Ghafoori and José António Campos E Matos</i>



	Room LUNA	Room EUROPA	Room GANIMEDE	Room PANORAMA
Session 3	Advances of the BRIDGE 50 Research Project: Residual Structural Performance of a 50-Year-Old PC Bridge (special session)	Testing, monitoring and digital twinning to assess the structural condition of existing bridges (special session)	Structural Deterioration and the Value of Information (special session)	Corrosion protection for concrete and steel bridges (special session)
Chair	Fabio Biondini	Carmelo Gentile	Paolo Gardoni	Martin van Leeuwen
h. 14.45	Residual Structural Performance of Existing PC Bridges: Recent Advances from the BRIDGE 50 Research Project <i>Fabio Biondini, Francesco Tondolo, Sergio Manto, Carlo Beltrami, Miriam Chiara, Barbara Salza, Matteo Tizzani, Bernardino Chiaia, Alessandro Lencioni, Luigi Panseri and Luigi Quaranta</i>	A simplified model for the reliability assessment of existing concrete girders in the perspective of digital twinning <i>Angelo Aloisio, Alessandro Contento, Rocco Alaggio and Massimo Fragiacomo</i>	Condition Assessment of a First Generation Precast Prestressed Bridges in Slovakia <i>Petra Bujřáková, Martin Moravčík and Jakub Kralovanc</i>	Prolonging the Lifetime of Existing Reinforced Concrete Infrastructures with Thermal Sprayed Zinc Coating Anodes <i>Martin van Leeuwen, Martin Gagné, Bernardo Duran and Frank Prenger</i>
h. 15.00	Non Destructive Testing and Model Validation of Corroded PC Bridge Deck Beams <i>Mattia Anghileri, Pierclaudio Savino, Luca Capacci, Silvia Bianchi, Gianpaolo Rosati, Francesco Tondolo and Fabio Biondini</i>	Application of different methods for determination of DAF from moving loads on roadway reinforced concrete bridges <i>Dejan Janev, Toni Arangjelovski, Darko Nakov and Goran Markovski</i>	Structural and durability assessment of heritage reinforced concrete structures <i>András Dormány and Zoltán Orbán</i>	Sustainable and durable corrosion protection for the "Bridge of the Century" <i>Frank Prenger and Hans-Bernd Pillkahn</i>
h. 15.15	On-site corrosion characterization of 50-year-old PC deck beams <i>Maddalena Carsana, Fabio Biondini, Elena Redaelli and Davide Ottavio Valoti</i>	From Uncertainty in Measurement to Certainty in Bridge Reassessment <i>Stefan Küttenbaum, Thomas Braml, Alexander Taffe and Stefan Maack</i>	Identifying barriers of Implementing BIM in Construction <i>Mohammad Amin Oyarhossein and Kasra Mostofi</i>	Zinc Spray galvanizing: technological improvement in the arc-spray technology, new Zn alloys. Thermal spraying process for a long-lasting life of steel against corrosion. <i>Mario Colica</i>
h. 15.30	Experimental Program and Full-Scale Load Tests on PC Deck Beams <i>Francesco Tondolo, Fabio Biondini, Donato Sabia, Gianpaolo Rosati, Bernardino Chiaia, Antonino Quattrone, Pierclaudio Savino and Mattia</i>	Serviceability assessment of a lively footbridge using conventional sensors and microwave remote sensing <i>Carmelo Gentile</i>	A Renewal Theory Formulation for the Quantification of the Benefits of Structural Health Monitoring <i>Leandro Iannacone, Pier Francesco Giordano, Paolo Gardoni and Maria Pina Limongelli</i>	Accelerated Corrosion Test to Study Atmospheric Corrosion on Steel Girder Bridges <i>Luis Miguel Moran Yañez</i>
h. 15.45	Nonlinear Structural Analysis of Corroded PC Bridge Deck Beams <i>Mattia Anghileri and Fabio Biondini</i>	Some considerations on the expected resonance frequencies of bridges during proof load tests <i>Sandro Carbonari, Riccardo Martini, Vanni Nicoletti, Davide Arezzo and Fabrizio Gara</i>	Effects of corrosion in the structural capacity of concrete deck bridges with steel or prestressed concrete girders <i>Leonardo Cifuentes, Mauricio Pradena and Patricio Cendoya</i>	Optimizing cover rebuilding maintenance for reinforced concrete structures exposed to chloride attack <i>Quynh Chau Truong, Charbel-Pierre El Soueidy, Emilio Bastidas-Arteaga and Yue Li</i>
h. 16.00	Dynamic Identification of damaged PC Bridge Beams <i>Donato Sabia, Antonino Quattrone, Francesco Tondolo and Pierclaudio Savino</i>	Contactless measuring systems for structural health monitoring of bridges <i>Tanja Kebig, Nils Olbermann, Michél Bender, Arno Zürbes and Stefan Maas</i>	Influence of bridge deterioration on its natural frequencies and serviceability <i>Matías Torres, Leonardo Cifuentes, Mauricio Pradena and Peter Dechent</i>	Norwegian Experience with Zinc Thermal Spraying for Bridges <i>Ole Øystein Knudsen, Håkon Matre, Knut Ove Dahle, Martin Gagné, Kristian Ringheim Moe, Karsten Tranborg Eriksen and Henrik Rødal Ler</i>
h. 16.15	Digitalization Processes and Bridge Information Modeling for Existing Bridges <i>Daniel Polonia Rodríguez, Francesco Tondolo, Anna Osello, Arianna Fonsati, Carlo De Gaetani, Claudio Trincianti and Dorian Gazzulli</i>			



	Room LUNA	Room EUROPA	Room GANIMEDE	Room PANORAMA
Session 4	Condition monitoring and assessment of degrading reinforced concrete structures (special session)	Testing, monitoring and digital twinning to assess the structural condition of existing bridges (special session)	Modelling and assessment of structures and infrastructures subject to extreme loading actions (special session)	Bridge Condition Assessment
Chair	Fritz Binder	Carmelo Gentile	Fabio Di Trapani	Mariano Angelo Zanini
h. 16.45	Diagnosis and Evaluation of Bridge Structures on Cogwheel Railway <i>Peter Koteš, Martin Vavruš and Martin Moravčík</i>	On the use of SAR data for structural monitoring of bridges: the case of Albiano-Magra Bridge in Italy <i>Elisabetta Farneti, Nicola Cavalagli, Ilaria Venanzi, Mario Costantini, Francesco Trillo, Federico Minati and Filippo Ubertini</i>	Are bridges safe under near-fault pulse-type ground motions considering the vertical component? <i>Matin Jami, Said Elias, Rajesh Rupakthey, Dario De Domenico, Giovanni Falsone and Giuseppe Ricciardi</i>	Bridge Condition Assessment using Supervised Decision Trees <i>Silvia Bianchi and Fabio Biondini</i>
h. 17.00	Concept to assess the performance on degrading concrete structures components <i>Fritz Binder and Stefan L. Burtscher</i>	Dynamic measurements using fiber optics: how to get meaningful data with your FBGs <i>John Odowd, Mark Jacobs</i>	Estimation of structural fire vulnerability through fragility curves <i>Enrico Cardellino, Donatella De Silva and Emidio Nigro</i>	A survey of bridge condition rating systems <i>Chiara Iacovino, Zehra Irem Turkeszer, Pier Francesco Giordano and Maria Pina Limongelli</i>
h. 17.15	Provisional measures for guaranteeing the functionality of existing bridges: the Agnena Bridge in Caserta Province <i>Mattia Zizi, Pasquale Bencivenga and Gianfranco De Matteis</i>	Framework for Bridge Management Systems (BMS) using Digital Twins <i>Vanessa Saback de Freitas Bello, Cosmin Popescu, Thomas Blanksvärd and Björn Täljsten</i>	Seismic retrofitting of prestressed concrete bridges through friction pendulum isolation bearings <i>Dario De Domenico, Silvia Sciutleri, Antonio D'Arrigo and Giuseppe Ricciardi</i>	Structural health monitoring of steel bridges by machine vision: Image processing <i>Foad Kazemi Majd, Nasim Fallahi and Vincenzo Gattulli</i>
h. 17.30	Remote inspection and monitoring of civil engineering structures based on Unmanned Aerial Vehicles <i>Rafael Cabral, Diogo Ribeiro, Ricardo Santos and Anderson Shibasaki</i>	Condition monitoring of external prestressing tendons on a concrete multi-span highway viaduct <i>Andrej Anžin, Ratko Švraka, Doron Hekič and Uroš Bohinc</i>	A comparison of CFRP retrofitted columns under lateral impact loads with different boundary conditions <i>Sicheng Zhou, Cristoforo Demartino and Yan Xiao</i>	Bridge Management System Based on Cost Action TU1406 Findings <i>Matej Kušar and Aleksander Srdić</i>
h. 17.45	Convolution neural network-based machine learning approach for visual inspection of concrete structures <i>Ravi Patel, Lucas Steinmann, Jonas Fehrenbach, David Fehrenbach and Frank Dehn</i>	Theoretical and Experimental Assessment of Indirect Dynamic Measurements for Periodic Inspections of Road Bridges <i>Stefano Ercolessi, Giovanni Fabbrocino, Danilo Gargaro and Carlo Rainieri</i>	Dynamic response of infilled frames subject to accidental column losses <i>Fabio Di Trapani, Giovanni Tomaselli, Antonio Pio Sberna, Marco Martino Rosso, Giuseppe Carlo Marano, Liborio Cavaleri and Gabriele Bertagnoli</i>	Modal characterization of a prestressed reinforced concrete bridge composed by decks with different ages <i>Carlo Pellegrino, Mariano Angelo Zanini, Flora Faleschini, Filippo Andreose, Klajdi Toška, Lorenzo Hofer, Paolo Zampieri and Gianantonio Feltrin</i>
h. 18.00	Application of Petri nets to manage bridge decks <i>Cláudia Ferreira, Luis Neves, José Campos E Matos and Ana Silva</i>	Resiliency Assessment of Existing Bridges – A Methodology to Guide the Rehabilitation of a Cantilever Bridge Opened in 1930 <i>Guy Larose, Pierre-Olivier Dallaire, Theresa Erskine, Emanuele Mattiello and Chiara Pozzuoli</i>	Development of a Steel Fiber-reinforced Rubber Concrete for Jacketing of Bridge Piers against Vehicular Impacts: Preliminary Results <i>Dade Lai, Lan Lin, Xiaoyu Yan, Zitong Li, Keqin Xu, Cristoforo Demartino and Yan Xiao</i>	Numerical analysis of cable-stayed bridges under blast loading <i>Cyrille Denis Tetougueni, Paolo Zampieri and Carlo Pellegrino</i>
h 18.15				Acoustic emission monitoring to evaluate the detection of adhesion of reinforcing rebar in the concrete beams <i>Giuseppe Nardoni, Nasim Fallahi, Mattia Bentoglio and Sara Zanoletti</i>



	Room LUNA	Room EUROPA	Room GANIMEDE	Room PANORAMA
Session 5	Risk management and classification of road bridges (special session)	Digitalization in bridge monitoring	Masonry arch bridges: Diagnostic, monitoring, structural assessment and strengthening (special session)	Quality control on green concrete structures (special session)
Chair	Paolo Clemente	Rade Hajdin	Paolo Zampieri	Amaia Santamaría
h. 11.00	BIM solutions for existing bridges management <i>Antonella Cosentino, Pietro Baratoro, Silvia Caprioli, Walter Salvatore and Ada Zirpoli</i>	Ontologies as the key for common understanding of infrastructure assets <i>Dušan Isailović and Rade Hajdin</i>	Fast adaptive limit analysis of masonry arch bridges in presence of differential settlements of bridge piles <i>Nicola Grillanda, Jacopo Scacco and Gabriele Milani</i>	<i>Thermal and bonding behavior of synthetic thin pavements for concrete bridge decks</i> <i>Giovanni Giacomello, Andrea Ballelo, Emiliano Pasquini and Marco Pasetto</i>
h. 11.15	Structural risk assessment of existing road bridges according to Italian Guidelines based on a territorial case study <i>Gianfranco De Matteis, Pasquale Bencivenga and Mattia Zizi</i>	Best practices of Information Modeling of bridges when the BIM use is the Finite Element structural analysis <i>Paolo Segala</i>	Combined adaptive limit analysis and discrete FE approach for the structural assessment of skew arches <i>Jacopo Scacco, Nicola Grillanda, Gabriele Milani and Paulo B. Louenço</i>	Behavior of real scale beams manufactured with electric arc furnace slag concrete <i>Amaia Santamaría, Jesús María Romera, Ignacio Marcos, Javier Jesús González and Victor Revilla-Cuesta</i>
h. 11.30	Towards Standardized and Interoperable Platforms for supporting the Seismic Vulnerability Assessment and Seismic Monitoring of Italian Bridges and Viaducts <i>Paolo Clemente, Sonia Giovinazzi, Maurizio Pollino, Vittorio Rosato, Laura Blaso, Giuseppina Giuliani, Nicoletta Gozo and Chiara Ormando</i>	Utilization of Digital Twins for bridge inspection, monitoring and maintenance <i>Marcos Massao Futai, Túlio Nogueira Bittencourt, Ruan Richelly Santos, Carlos Roberto Ribeiro Araújo, Duperron Marangon Ribeiro, André Rodrigues Da Rocha and Rosana Ellis</i>	Virtual investigation of masonry arch bridges: digital procedures for inspection, diagnostics, and data management <i>Giovanni Fabbrocino, Francesca Savini, Adriana Marra and Ilaria Trizio</i>	Environmental Performance Indicators for Roadway and Highway Infrastructures Management <i>Flora Faleschini and Mariano Angelo Zanini</i>
h. 11.45	The new guidelines of Italian Ministry of Infrastructures for the structural risk classification of existing bridges: genesis, examples of application and practical considerations <i>Antonella Cosentino, Giovanni Buratti, Francesco Morelli, Walter Salvatore, Simone Celati, Domenico Gaudio and Isabella Mazzatura</i>	<i>BIM Bridge Engineering Workflow with SOFISTIK and Revit on a case study of 3 Motorway bridges on the BAB A3 in Germany</i> <i>Thomas Braml , Robert Herceg, Emanuele Agostini</i>	Rigid block modelling of a masonry bridge subjected to foundation settlements: a comparison between linear and non-linear kinematic analysis <i>Raffaele Gagliardo, Giusy Terracciano, Lucrezia Cascini, Francesco Portioli and Raffaele Landolfo</i>	Application of the non-destructive methods to the determination of discontinuities between the bridge steel box girder and concrete <i>Maria Grozdanić, Dalibor Sekulic and Karla Ille</i>
h. 12.00	<i>Development of a Bridge Management System (BMS) based on the new guidelines of the Italian Ministry of Transportation</i> <i>Silvia Manarin, Mariano Angelo Zanini, Flora Faleschini and Carlo Pellegrino</i>	Building Information Modeling for Bridge Design and Construction <i>Yiannis Xenidis</i>	Masonry Arch Bridges in Long-term Operation on Slovak Railway Network <i>Patrik Kotula and Ondrej Kridla</i>	Development of conformity criteria for diffusion coefficients of concrete and their influence on the service life of reinforced concrete structures <i>Eline Vereecken, Wouter Botte and Robby Caspeele</i>
h. 12.15	A Model for the Assessment of the Seismic Resilience of Road Networks <i>Alessandro Rasulo, Angelo Pelle, Camillo Nuti and Bruno Briseghella</i>	BIM-based organization of inspection data using Semantic Web technology for infrastructure asset management <i>Liu Liu, Philipp Hagedorn and Markus König</i>	Evaluation of seismic vulnerability of the historical SS Filippo e Giacomo masonry arch bridge in Ascoli Piceno (Italy) <i>Graziano Leoni, Fabrizio Gara and Michele Morici</i>	Compressive-strength evaluation of recycled aggregate self-compacting concrete through hammer rebound index <i>Victor Revilla-Cuesta, Vanesa Ortega-López, Flora Faleschini, Amaia</i>



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Session 6	Risk management and classification of road bridges (special session)	Resilience of infrastructure	Masonry arch bridges: Diagnostic, monitoring, structural assessment and strengthening (special session)	Structural Health Monitoring (special session)
Chair	Silvia Caprili	Fabrizio Gara	Nicola Cavalagli	Vikram Pakrashi
h. 14.45	Application of a simplified load rating method for scoring existing bridges: a territorial case study in Basilicata <i>Michele D'Amato and Gianfranco De Matteis</i>	<i>Importance Sampling in Life-Cycle Seismic Fragility and Risk Assessment of Aging Bridge Networks</i> <i>Luca Capacci and Fabio Biondini</i>	Numerical analysis of masonry arch bridges subject to scour effect <i>Federico Di Marco, Tetougueni Cyrille Denis, Paolo Zampieri and Carlo Pellegrino</i>	<i>Innovative Technologies for Structural Health Monitoring of SFTs: Combination of InfraRed Thermography with Mixed Reality</i> <i>Vittorio Palma, Giacomo Iovane, Soonkyu Hwang, Federico M. Mazzolani, Raffaele Landolfo, Beatrice Faggiano and Hoon Sohn</i>
h. 15.00	GENIA: Tool for digitizing the operational flow associated with the main inspections of highway bridges <i>Ignacio Piñero, Leire Garmendia, Amaia Santamaria and Laura Pérez</i>	Resilience-based decision support tool for management of transportation infrastructure <i>Nikola Tanasic and Rade Hajdin</i>	Assessment of masonry bridges with the help of combined NDT methods <i>Zoltán Orbán and András Dormány</i>	Use of Copernicus satellite data to investigate the soil-structure interaction and its contribution to the dynamics of a monitored monumental building <i>Rosario Ceravolo, Stefania Coccimiglio, Giorgia Coletta, Mohamad Dabdoub, Erica Lenticchia and Gaetano Miraglia</i>
h. 15.15	Evolution of design traffic loads for Italian road bridges <i>Pasquale Bencivenga, Giovanni Buratti, Antonella Cosentino, Gianfranco De Matteis, Francesco Morelli, Walter Salvatore and Mattia Zizi</i>	Assessing the resilience of a bridge struck by multiple hazards <i>Lorenzo Hofer and Mariano Angelo Zanini</i>	Rigid-block analysis in large displacements of masonry arches on vertically moving supports <i>Stefano Galassi, Giulia Misseri and Luisa Rovero</i>	Instrumenting an Operational Train for Continuous Monitoring of Bridges and Track <i>E. Alexandra Micu, Eugene Obrien, Cathal Bowe, Favour Osose Okosun, David Morgan and Vikram Pakrashi</i>
h. 15.30	Assessment of inspection procedures for pre-stressed concrete bridges with post-tensioned cables <i>Filippo Latte Bovio, Francesco Chichi, Marco Ciano, Simone Ferrari, Massimo Gammino, Marcello Guelpa, Massimiliano La Porta, Daniele Maestrini, Gianpaolo Marconi, Isabella Mazzatura, Davide Morandi, Francesco Morelli, Michele Mori, Ivan Panzera, Paolo Papeschi, Andrea Piscini and Walter Salvatore</i>	<i>Damage Scenario and Economic Losses Estimation of Historical Earthquakes occurred in Northeastern Italy</i> <i>Lorenzo Hofer and Mariano Angelo Zanini</i>	Discussion on the nonlinear horizontal behavior of a multi-span masonry bridge <i>Paolo Zampieri, Tetougueni Cyrille Denis and Carlo Pellegrino</i>	Water-structure interaction analysis of a segmental bridge using ambient vibration testing at different water levels <i>Wilson Alexander Hernández Sierra, Alvaro Viviescas and Carlos Alberto Riveros Jerez</i>
h. 15.45	The future of bridge inspection and management: the "Autostrade per l'Italia & Movyon" strategy (part I) <i>Marzia Malavisi</i>	Overview of the activities of DICEA in the INTERREG FIRESPILL project <i>Carmelo Maiorana, Carlo Pellegrino, Giovanna Xotta, Mariano Angelo Zanini, Lorenzo Hofer</i>	A study on live load effects in railway backfilled arch bridges <i>Tomasz Kamiński and Czesław Machelski</i>	An experimental study on the sorption in UHPFRC: adaptation of the DVS measurement procedure <i>Xuande Chen, Juliette Triquet, Thomas Sanchez, Madura Pathirage, Luca Sorelli and Gianluca Cusatis</i>
h. 16.00	The future of bridge inspection and management: the "Autostrade per l'Italia & Movyon" strategy (part II) <i>Marzia Malavisi</i>	Metamodel-based Reliability Assessment of Reinforced Concrete Beams Under Fatigue Loads <i>Silvia Juliana Sarmiento Nova, Gabriel Sas, Jaime Gonzalez-Libreros, Lennart Elfgron, Ibrahim Coric and Ola Enoksson</i>	Derivation of fragility curves for the seismic vulnerability assessment of railway masonry arch bridges <i>Carlo Filippo Manzini, Paolo Morandi, Barbara Borzi, Francesco Iodice, Alberto Mauro, Andrea Vecchi and Franco Iacobini</i>	Scour Repair of Bridges through Vibration Monitoring and Related Challenges <i>E. Alexandra Micu, Muhammad Arslan Khan, Basuraj Bhowmik, Miguel Casero Florez, Eugene Obrien, Cathal Bowe and Vikram Pakrashi</i>



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Session 7	Risk management and classification of road bridges (special session)	Retrofitting	Masonry arch bridges: Diagnostic, monitoring, structural assessment and strengthening (special session)	Reinforced Concrete Structures
Chair	Giuseppe Andrea Ferro	Flora Faleschini	Mattia Zizi	Giuseppe Carlo Marano
h. 16.45	Assessment and upgrading of weakly shear reinforced bridge decks: a case study <i>Raoul Davide Innocenzi, Giandomenico Massa, Vanni Nicoletti, Sandro Carbonari, Fabrizio Gara and Luigino Dezi</i>	Refurbish and reinforcement of bridges, viaducts, tunnels: innovative construction methods and materials <i>Giorgio Giacomini</i>	Masonry arch bridges: typical features and structural issues <i>Pasquale Bencivenga, Mattia Zizi and Gianfranco De Matteis</i>	Dynamic compressive behavior of recycled bricks aggregate concrete under SHPB tests <i>Beibei Xiong, Cristoforo Demartino, Giuseppe Carlo Marano, Fabio Di Tranpani, Jinjun Xu and Yan Xiao</i>
h. 17.00	La Reale viaduct collapse: a lesson to improve the effectiveness of inspections of segmental post-tensioned bridges and viaducts <i>Giuseppe Andrea Ferro, Luciana Restuccia, David Falliano, Achille Devitofranceschi and Angelo Gemelli</i>	Rapid repair of damaged RC columns through CFRM confinement <i>Klajdi Toska, Flora Faleschini, Mariano Angelo Zanini, Lorenzo Hofer and Carlo Pellegrino</i>	Numerical investigation of a Medieval masonry arch bridge based on a discrete macro-element modeling approach <i>Luca Penazzato, Daniel V. Oliveira, Davide Rapicavoli, Paolo Zampieri, Paulo B. Lourenço, Ivo Calió and Carlo Pellegrino</i>	Reliability-targeted behaviour factor evaluation for code compliant RC Italian frames <i>Mariano Angelo Zanini and Gianantonio Feltrin</i>
h. 17.15	Influence of the deck length on the fragility assessment of Italian r.c. link slab bridge <i>Lucia Minnucci, Fabrizio Scozzese, Andrea Dall'Asta, Sandro Carbonari and Fabrizio Gara</i>	Field investigation on the reinforcing steel corrosion of RC infrastructures in Abruzzo <i>Ferdinando Totani, Angelo Aloisio, Danilo Ranalli and Gianfranco Totani</i>	The effect of the associative friction in the seismic limit analysis of masonry arches with uncertain geometry <i>Paolo Zampieri, Ludovico Rossi, Nicola Cavalagli, Vittorio Gusella and Carlo Pellegrino</i>	Seismic reliability and cost analysis of code compliant RC Italian frames <i>Mariano Angelo Zanini and Gianantonio Feltrin</i>
h. 17.30	The SHM as Higher Level Inspection in the Evaluation of Structures <i>Chiara Ormando, Farnaz Raeisi, Paolo Clemente and Aftab Mufti</i>	FRM-confined concrete: influence of cross-section geometry on cyclic stress-strain behavior <i>Klajdi Toska and Flora Faleschini</i>	Determining and tuning models of a masonry bridge for structural assessment <i>Paolo Borlenghi, Antonella Saisi and Carmelo Gentile</i>	Methodology for the study of pre-stressed concrete bridges affected by alkali-silica reaction <i>Ismael Carpintero, Eduardo López, Jorge Rueda and Victor Lanza</i>
h. 17.45	Monitoring-based decision support system for risk management of bridge scour <i>Enrico Tubaldi, Andrea Maroni, Daniele Zonta and Hazel McDonald</i>	Extending the Lifecycle of Damaged Structure by Retrofitting New Bridge Design Concepts in Old Structures <i>Alexander Jiponov and Vasil Nikolov</i>	The Somigliana's Double Dislocation method for the calculation of the live loads collapse multiplier of masonry arch bridges <i>Giuseppe Stagnitto, Roberto Siccardi and Massimiliano Ghioni</i>	Uniform and local corrosion characterization and modeling framework for long-term exposure of different rebars used for RC elements in the presence of chloride conditions <i>Deeparekha Narayanan, Yi Lu, Ayman Okeil and Homero Castaneda</i>
h. 18.00	Local scour-induced failure of existing masonry arch bridges <i>Fabrizio Scozzese, Laura Ragni, Enrico Tubaldi and Fabrizio Gara</i>	CFRP strengthened Reinforce Concrete Square Elements under Unequal Lateral Impact Load <i>Khalil Al-Bukhaiti, Liu Yanhui, Zhao Shichun and Hussien Abas</i>	Model calibration of a historic masonry arch bridge using a probabilistic approach <i>Brais Barros González, Borja Conde Carnero, Luis Javier Sanchez-Aparicio, Manuel Cabaleiro Núñez, Oscar Bouzas Rodriguez and Belén Riveiro Rodriguez</i>	Acoustic emission monitoring of the chloride-induced corrosion process in reinforced concrete <i>Eline Vandecruys, Charlotte Van Steen, Eline Vereecken, Geert Lombaert and Els Verstryngne</i>



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Session 8	Corrosion influence on the residual performance of RC and pre-stressed bridges (special session)	Modelling of nonlinear and uncertain behavior of concrete bridges (special session)	Risk assessment of bridges	Railway Bridges (special session)
Chair	Ilaria Venanzi	Alfred Strauss	Cristoforo Demartino	Pedro Aires Montenegro
h. 11.00	Analytical modelling of transmission and anchorage length in corroded pre-tensioned concrete elements <i>Sergio Belluco, Nicola Fabris and Flora Faleschini</i>	Taylor Series Expansion for Statistical Analysis of Existing Concrete Bridge <i>Lukas Novak and Drahomir Novak</i>	<i>Time-variant seismic reliability of code-compliant RC bridges</i> <i>Klajdi Toska, Mariano A. Zanini and Flora Faleschini</i>	Development of damage detection methodologies in bridges using drive-by methods and machine learning algorithms: a systematic review of the literature <i>Edson F. Souza, Tulo N. Bittencourt, Diogo R. Ribeiro and Hermes Carvalho</i>
h. 11.15	Fragility analysis of monitored reinforced concrete bridges subjected to cumulative effect of seismic damage and corrosion deterioration <i>Michela Torti, Ilaria Venanzi, Stefano Sacconi, Laura Ierimonti and Filippo Ubertini</i>	Modelling of Nonlinear and Uncertain Behavior of Concrete Bridges <i>Eftychia Apostolidi, Martina Šomodiková, Alfred Strauss, Drahomir Novak, Radomir Pukl and David Lehký</i>	Reliability-Based Bayesian Updating using Visual Inspections of Existing Bridges <i>Erica Arango, Monica Santamaria, Helder Sousa and Jose Matos</i>	Uncertainty and track stability: analysis of partial safety factors for high-speed railway bridges <i>Gonçalo Ferreira, Pedro Aires Montenegro, António Henriques and Rui Calçada</i>
h. 11.30	Variability in section loss and maximum pit depth of corroded prestressing wires <i>Lorenzo Franceschini, Francesca Vecchi, Francesco Tondolo, Beatrice Belletti, Javier Sanchez Montero and Paolo Minetola</i>	Nonlinear reliability assessment of post-tensioned concrete bridge made of I-73 girders <i>Martin Lipowczan and David Lehký</i>	<i>Bridge damage detection and quantification under environmental effects by Principal Component Analysis</i> <i>Fernando Tenelema, Rick Delgado and Joan Casas</i>	Modelling the long-term behaviour of a high-speed railway transition zone using a lumped parameter track model <i>Ilaria Grossoni, Samuel Hawksbee, Pedro Jorge and Yann Bezin</i>
h. 11.45	Testing to reassess – Corrosion activity assessment based on NDT using a prestressed concrete bridge as case-study <i>Stefan Maack, Roberto Torrent, Gino Ebell, Tobias Völker and Stefan Küttenbaum</i>	Probabilistic & semi-probabilistic analyses of Bridge Structures - Multi-level modelling based assessment of existing structures <i>Fabian Sattler and Alfred Strauss</i>	<i>Technical risks and, intervention and mitigation actions in bridges. A Technical Management Strategy</i> <i>Felipe Collazos-Arias, David Garcia-Sánchez and Álvaro Gaute-Alonso</i>	Dynamic response of poles built on railway bridges under high-speed train passages <i>Kodai Matsuoka, Mizuki Tsunemoto and Munemasa Tokunaga</i>
h. 12.00	Analytical models for the force-displacement response of a corroded seven-wire strand <i>Matteo Marra, Michele Palermo, Stefano Silvestri and Tomaso Trombetti</i>	The role of non-linear finite element modelling in practical safety assessments of structures and suitable safety formats for NLFEM <i>Matthias Rigler and Alfred Strauss</i>	Fatigue resistance of steel arch bridge hanger connection plates due to transverse welding <i>Philippe Van Bogaert</i>	Influence of the level of track irregularities in the derailment risk of a high-speed train moving over a bridge <i>Marco A. Peixer, Pedro A. Montenegro, Hermes Carvalho, Tulo N. Bittencourt and Rui Calçada</i>
h. 12.15	<i>Modeling non-uniform corrosion in reinforced concrete bridge piers</i> <i>Davide Bernardini, Daniela Ruta, Paolo Di Re and Achille Paolone</i>	Effect of substructure irregularity on the seismic vulnerability of short-span bridges <i>Khshayar Heydarpour, Pasquale Bencivenga, Hadi Monsef Ahmadi, Mattia Zizi and Gianfranco De Matteis</i>	Service life extension of early age steel bridges by reducing dead weight <i>Philippe Van Bogaert</i>	Experimental Verification of Extradosed Railway Bridge Behaviour <i>Ján Bujňák and Jaroslav Odrobiňák</i>



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