

IABMAS2016

8th International Conference on Bridge
Maintenance, Safety and Management
June 26 - 30 | Foz do Iguaçu | Brazil

CONFERENCE PROGRAM



CONFERENCE PROGRAM BOOK

01. Welcome Message.....	04
02. Conference Chairs.....	05
03. International Scientific Committee.....	06
04. National Advisory Committee.....	08
05. National Organizing Committee.....	08
06. Conference Venue Map.....	09
07. General Information.....	10
08. Exhibition.....	14
09. Sponsors.....	15
10. Program at a Glance.....	16
11. Scientific Program.....	20

1. WELCOME MESSAGE

The Brazilian IABMAS Group is thrilled and honored for hosting the 8th International Conference on Bridge Maintenance, Safety and Management (IABMAS 2016) in Brazil. The conference will be held in Foz do Iguaçu, PR, from June 26-30, 2016. The conference is organized on behalf of the International Association for Bridge Maintenance and Safety (IABMAS), under the auspices of the University of São Paulo, SP, Brazil.

As an international association with many national chapters, IABMAS has developed into a high level forum for discussion of academic, scientific and technical aspects of bridge maintenance, safety, and management.

The international IABMAS 2016 conference aims at providing an appropriate atmosphere for the exchange of experiences related to bridge maintenance, safety, and management. IABMAS 2016 will bring together academics, researchers, and practicing professionals, bridging the gap between theory and practice in bridge maintenance, safety, and management. IABMAS 2016 will provide an informal atmosphere and sufficient free time for scientific connections, interactions with past and future collaborators, and so on.

The conference will be held in Foz do Iguaçu, Paraná, Brazil. Foz do Iguaçu is a place of converge for rivers, borders, nature, technology and people. Near the meeting of Paraná and Iguaçu rivers are the Iguaçu falls, listed as one of the New 7 Wonders of Nature, with a flow of up to 45 million liters per second, and worship place for Guarani Indians since ancient times. The triple border between Brazil, Argentina and Paraguay is a melting pot for Lebanese, Chinese, Germans, Italians, French, Swedes, Portuguese and Ukrainians; also for Christians, Muslims and Buddhists. Foz do Iguaçu is home to the Itaipu dam, the world's largest hydroelectric plant in power generation. In June 2016, Foz do Iguaçu will be the convergence place for academics, researchers and practitioners of bridge maintenance, safety and management, and a place for you to merge with nature and with other cultures.

We look forward to welcoming you to Foz do Iguaçu, Brazil, for IABMAS 2016.

Sincerely,

Tulio N. Bittencourt, Dan M. Frangopol and André T. Beck
Chairs of IABMAS 2016



2. CONFERENCE CHAIRS

CONFERENCE CHAIRS

André Teófilo Beck

University of São Paulo, São Paulo, SP, Brazil

Dan M. Frangopol

Lehigh University, Bethlehem, PA, USA

Tulio Nogueira Bittencourt

University of São Paulo, São Paulo, SP, Brazil

HONORARY CHAIRS

Antonio Carlos Laranjeiras

Federal University of Bahia, BA, Salvador, Brazil

Augusto Carlos Vasconcelos

IBRACON, São Paulo, SP, Brazil

3. INTERNATIONAL SCIENTIFIC COMMITTEE

CO-CHAIRS

Airong Chen	<i>Tongji University, Shanghai, China</i>
Andrzej Nowak	<i>Auburn University, Auburn, USA</i>
Eugen Bruehwiler	<i>EPFL, Lausanne, Switzerland</i>
Hyun-Moo Koh	<i>Seoul National University, Seoul, Korea</i>
Joan R. Casas	<i>Technical University of Catalonia, Barcelona, Spain</i>
Julio Timerman	<i>Engeti Engenharia, São Paulo, Brazil</i>

MEMBERS

A. Emin Aktan	<i>Drexel University, Philadelphia, PA, USA</i>
Ales Znidaric	<i>Slovenian National Building and Civil Engineering Institute, Ljubljana, Slovenia</i>
Alessandro Palermo	<i>University of Canterbury, Christchurch, New Zealand</i>
Alfred Strauss	<i>University of Natural Resources & Applied Life Sciences, Vienna, Austria</i>
Alfredo H.S. Ang	<i>University of California, Irvine, CA, USA</i>
André Beck	<i>University of São Paulo, São Carlos, Brazil</i>
André D. Orcesi	<i>Laboratoire Central des Ponts et Chaussées, Paris, France</i>
Andrea Del Grosso	<i>University of Genoa, Genoa, Italy</i>
Anil K. Agrawal	<i>The City College of New York, New York, NY, USA</i>
Antonio Mari	<i>Technical University of Catalonia, Barcelona, Spain</i>
Ayaho Miyamoto	<i>Yamaguchi University, Ube, Japan</i>
Ayaz Malik	<i>Rensselaer Polytechnic Institute, Troy, NY, USA</i>
Bala Sivakumar	<i>HNTB Corporation, New York, NY, USA</i>
Baochun Chen	<i>Fuzhou University, Fuzhou, China</i>
Barney Martin	<i>Modjeski & Masters, Poughkeepsie, NY, USA</i>
Bill Spencer	<i>University of Illinois, Urbana-Champaign, IL, USA</i>
Bruce Ellingwood	<i>Georgia Institute of Technology, Atlanta, GA, USA</i>
Bryan T. Adey	<i>ETH Zürich, Zürich, Switzerland</i>
Carlos Eduardo Nigro Mazzilli	<i>University of São Paulo, São Paulo, Brazil</i>
Chad Kusko	<i>Lehigh University, Bethlehem, PA, USA</i>
Chan Ghee Koh	<i>National University of Singapore, Singapore</i>
Christian Cremona	<i>Laboratoire Central des Ponts et Chaussées, Paris, France</i>
Chunsheng Wang	<i>Chang'an University, China</i>
Claudio Modena	<i>University of Padua, Padua, Italy</i>
Colin Caprani	<i>Monash University, Melbourne, Australia</i>
Dan M. Frangopol	<i>Lehigh University, Bethlehem, PA, USA</i>
Daniele Inaudi	<i>SMARTEC SA, Manno, Switzerland</i>
David De Leon	<i>Autonomous University of Mexico State, Toluca, Mexico</i>
Dong Xu	<i>Tongji University, Shanghai, China</i>
Douglas Paul Gauvreau	<i>University of Toronto, Toronto, Canada</i>
Eiichi Watanabe	<i>Kyoto University, Kyoto, Japan</i>
Fabio Biondini	<i>Politecnico di Milano, Milan, Italy</i>
Fernando Branco	<i>Technical University of Lisbon, Lisbon, Portugal</i>
Franco Bontempi	<i>University of Rome La Sapienza, Rome, Italy</i>
Frank Vecchio	<i>University of Toronto, Toronto, Canada</i>
George Deodatis	<i>Columbia University, New York, NY, USA</i>
Glauco Feltrin	<i>Swiss Fed. Labs. for Materials Testing & Research, Dübendorf, Switzerland</i>
Gongkang Fu	<i>Illinois Institute of Technology, Chicago, USA</i>
Hak Eun Lee	<i>Korea University, Seoul, Korea</i>
Haluk Aktan	<i>Western Michigan University, Kalamazoo, MI, USA</i>
Hani Nassif	<i>Rutgers University, New Brunswick, NJ, USA</i>
Harald Budelmann	<i>Technical University of Braunschweig, Braunschweig, Germany</i>
Herbert Wiggensauser	<i>BAM, Berlin, Germany</i>
Hitoshi Furuta	<i>Kansai University, Osaka, Japan</i>
Ho-Kyung Kim	<i>Seoul National University, Seoul, Korea</i>
James Brownjohn	<i>University of Exeter, Exeter, UK</i>
Jan Bien	<i>Wroclaw University of Technology, Wroclaw, Poland</i>
Jens Sandager Jensen	<i>COWI A/S, Lyngby, Denmark</i>
João Almeida Fernandes	<i>National Civil Engineering Laboratory, Lisbon, Portugal</i>
Joaquim Figueirias	<i>University of Porto, Porto, Portugal</i>

Jose Campos Matos	<i>Universidade do Minho, Guimarães, Portugal</i>
José Tadeu Balbo	<i>University of São Paulo, São Paulo, Brazil</i>
Jung Sik Kong	<i>Korea University, Seoul, Korea</i>
Jurgen Krieger	<i>Bundesanstalt für Straßenwesen (BASt), Bergisch Gladbach, Germany</i>
Limin Sun	<i>Tongji University, Shanghai, China</i>
Livia Pardi	<i>Autostrade per l'Italia, Rome, Italy</i>
Luc Taerwe	<i>University of Ghent, Ghent, Belgium</i>
Luis Simões da Silva	<i>Universidade de Coimbra, Coimbra, Portugal</i>
Luiz Carlos da Silva Pinto	<i>Federal University of Rio Grande do Sul, Porto Alegre, Brazil</i>
Man-Chung Tang	<i>T.Y. Lin International, San Francisco, CA, USA</i>
Maria Kaszynska	<i>ZUT University, Poland</i>
Marios Chryssanthopoulos	<i>University of Surrey, Guilford, Surrey, UK</i>
Mark Reno	<i>Quincy Engineering Inc., Sacramento, CA, USA</i>
Mark Stewart	<i>University of Newcastle, Newcastle, Australia</i>
Massao Futai	<i>University of São Paulo, São Paulo, Brazil</i>
Mehdi Saiidi	<i>University of Nevada, Reno, NV, USA</i>
Michael Forde	<i>University of Edinburgh, Edinburgh, UK</i>
Michel Ghosn	<i>The City College of New York, New York, NY, USA</i>
Michele Pfeil	<i>Federal University of Rio de Janeiro, Rio de Janeiro, Brazil</i>
Mitsuyoshi Akiyama	<i>Waseda University, Tokyo, Japan</i>
Naeem Hussain	<i>ARUP, Hong Kong, China</i>
Necati Catbas	<i>University of Central Florida, Orlando, FL, USA</i>
Nenad Gucunski	<i>Rutgers University, Piscataway, NJ, USA</i>
Nigel Powers	<i>VIC Roads, Camberwell, Victoria, Australia</i>
Nurdan M. Apaydin	<i>1st Division of General Directorate, Istanbul, Turkey</i>
Paolo Bocchini	<i>Lehigh University, Bethlehem, USA</i>
Paul Thompson	<i>Bellevue, WA, USA</i>
Paulo Cruz	<i>University of Minho, Guimaraes, Portugal</i>
Paulo Helene	<i>PhD Engenharia, University of São Paulo, São Paulo, Brazil</i>
Pedro Vellasco	<i>State University of Rio de Janeiro, Rio de Janeiro, Brazil</i>
Pier Giorgio Malerba	<i>Politecnico di Milano, Milan, Italy</i>
Rade Hajdin	<i>Infrastructure Management Consultants GmbH, Zürich, Switzerland</i>
Reed Ellis	<i>Stantec Consulting Ltd., Edmonton, Alberta, Canada</i>
René Maquoi	<i>University of Liège, Liège, Belgium</i>
Riadh Al-Mahaidi	<i>Swinburne University of Technology, Melbourne, Australia</i>
Riccardo Zandonini	<i>University of Trento, Trento, Italy</i>
Richard Sause	<i>Lehigh University, Bethlehem, PA, USA</i>
Risto Kiviluoma	<i>Department of Civil and Structural Engineering, Helsinki, Finland</i>
Robert Sweeney	<i>Consultant to Modjeski & Masters, Montreal, QC, Canada</i>
Rolando Salgado Estrada	<i>University of Veracruz, Veracruz, México</i>
Romilde Almeida de Oliveira	<i>Federal University of Pernambuco, Recife, Brazil</i>
Ronaldo Battista	<i>Controlar Engenharia, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil</i>
Rosemarie Helmerich	<i>Federal Institute for Materials Research and Testing, Berlin, Germany</i>
Rui Calçada	<i>University of Porto, Porto, Portugal</i>
Sang-Hyo Kim	<i>Yonsei University, Seoul, Korea</i>
Sérgio Hampshire	<i>ABPE, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil</i>
Sheila Duwadi	<i>Federal Highway Administration, McLean, VA, USA</i>
Sofia Diniz	<i>Federal University of Minas Gerais, Belo Horizonte, MG, Brazil</i>
Sreenivas Alampalli	<i>New York State Department of Transportation, Albany, NY, USA</i>
Sujeeva Setunge	<i>RMIT University, Melbourne, Australia</i>
Tatjana Isakovic	<i>University of Ljubljana, Ljubljana, Slovenia</i>
Túlio N. Bittencourt	<i>University of São Paulo, São Paulo, Brazil</i>
Victor Popa	<i>Search Corporation, Bucharest, Romania</i>
Wenliang Lu	<i>Beijing Jiaotong University, Beijing, China</i>
Xin Ruan	<i>Tongji University, Shanghai, China</i>
Yaojun Ge	<i>Tongji University, Shanghai, China</i>
Yiannis Tsompanakis	<i>National Technical University of Athens, Athens, Greece</i>
Yiqiang Xiang	<i>Zhejiang University, Hangzhou, China</i>
You-Lin Xu	<i>Hong Kong Polytechnic University, Hong Kong, China</i>
Yunfeng Zhang	<i>University of Maryland, College Park, Maryland, USA</i>
Zhishen Wu	<i>Ibaraki University, Hitachi, Japan</i>
Zhiwen Liu	<i>Hunan University, Changsha, China</i>

4. NATIONAL ADVISORY COMMITTEE

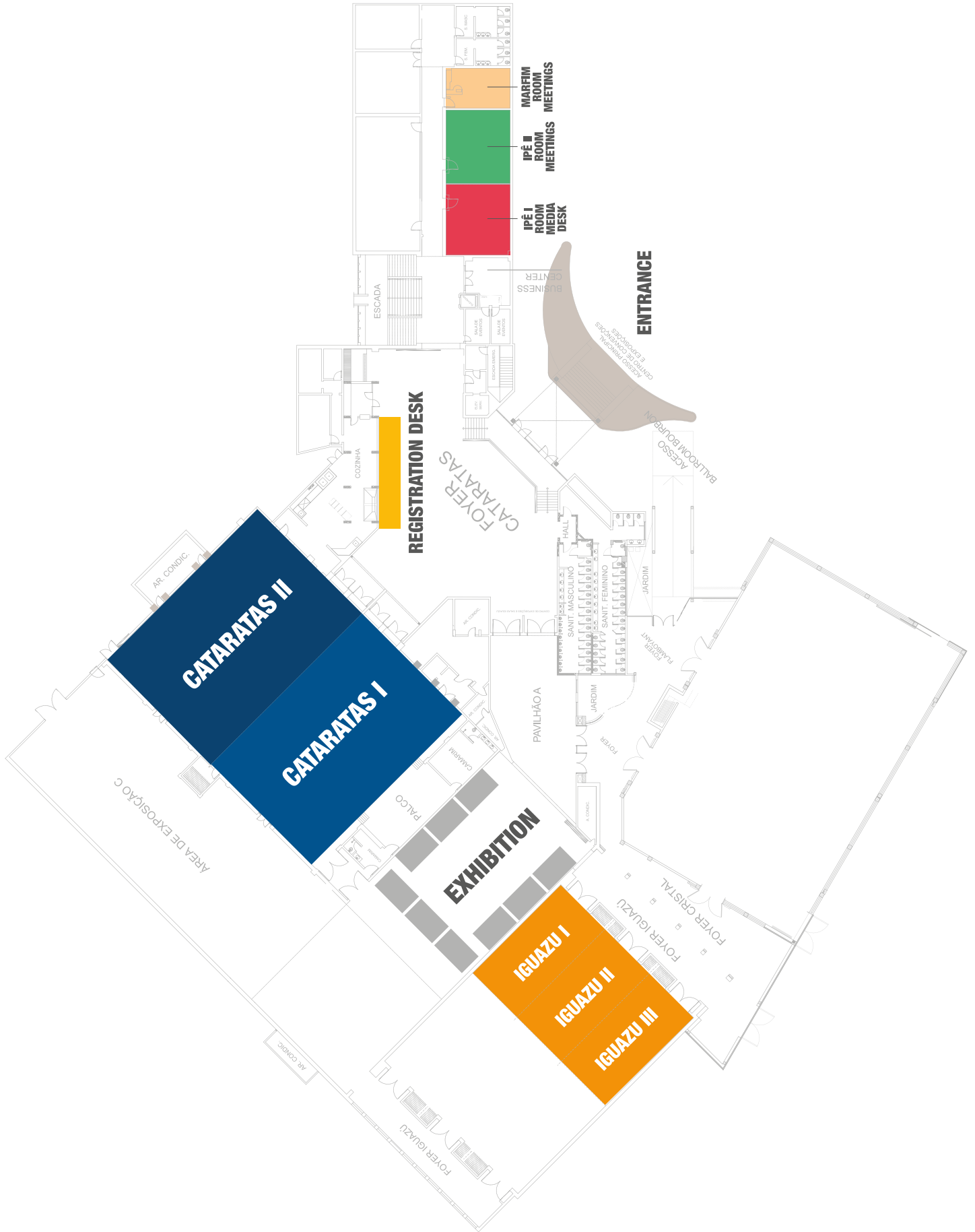
MEMBERS

Ana Elisabete Jacintho	<i>Pontifical Catholic University of Campinas, Campinas, Brazil</i>
André Andrade	<i>VALE, São Luís, Brazil</i>
Arnaldo da Silva Junior	<i>ARTERIS, São Paulo, Brazil</i>
Bernardo Tutikian	<i>University Vale do Rio dos Sinos, São Leopoldo, Brazil</i>
Eduardo Machado	<i>VALE, Vitória, Brazil</i>
Fábio Borges	<i>Brazilian Army, Brasília, Brazil</i>
Fernando Rebouças Stucchi	<i>EGT, University of São Paulo, São Paulo, Brazil</i>
José L. Antunes de Oliveira Sousa	<i>University of Campinas, Campinas, Brazil</i>
Leandro Mouta Trautwein	<i>University of Campinas, Campinas, Brazil</i>
Liedi Bernucci	<i>University of São Paulo, São Paulo, Brazil</i>
Luciano Bezerra	<i>University of Brasília, Brasília, Brazil</i>
Luis Augusto Conte Veloso	<i>Federal University of Pará, Belém, Brazil</i>
Luiz Carlos da Silva Pinto	<i>Federal University of Rio Grande do Sul, Porto Alegre, Brazil</i>
Mounir El Debs	<i>University of São Paulo, São Carlos, Brazil</i>
Ricardo Carrazedo	<i>University of São Paulo, São Carlos, Brazil</i>
Roberto Daledone Machado	<i>Federal University of Paraná, Curitiba, Brazil</i>
Roberto Pinto	<i>Federal University of Santa Catarina, Florianópolis, Brazil</i>
Rodolfo Montoya	<i>VALE, São Luís, Brazil</i>
Rodrigo Moysés Costa	<i>Ultralab, Belo Horizonte, Brazil</i>
Romilde Oliveira	<i>Federal University of Pernambuco, Recife, Brazil</i>
Rui Oyamada	<i>University of São Paulo – Outec Engenharia, São Paulo, Brazil</i>
Vladimir Guilherme Haach	<i>University of São Paulo, São Paulo, Brazil</i>
Wayne Santos de Assis	<i>Federal University of Alagoas, Maceió, Brazil</i>

5. NATIONAL ORGANIZING COMMITTEE

Alberto Belotti Colombo	<i>University of São Paulo, São Paulo, Brazil</i>
Alfredo Pinto da Conceição Neto	<i>University of São Paulo, São Paulo, Brazil</i>
Antonio Figueiredo	<i>University of São Paulo, São Paulo, Brazil</i>
Aref Kalilo Lima Kzam	<i>Latin-American Integration University, Foz do Iguaçu, Brazil</i>
Claudius de Sousa Barbosa	<i>University of São Paulo, São Paulo, Brazil</i>
Enson de Lima Portela	<i>University of São Paulo, São Paulo, Brazil</i>
Juliana Ferreira Fernandes	<i>University of São Paulo, São Paulo, Brazil</i>
Leila Meneghetti Valverdes	<i>University of São Paulo, São Paulo, Brazil</i>
Luis Antonio G. Bitencourt Jr.	<i>University of São Paulo, São Paulo, Brazil</i>
Oswaldo Luis Manzoli	<i>State University of São Paulo, Bauru, Brazil</i>
Ramon Saleno Yure Costa e Silva	<i>VALEC, University of Brasília, Brasília, Brazil</i>
Valério Almeida	<i>University of São Paulo, São Paulo, Brazil</i>

6. CONFERENCE VENUE MAP



7. GENERAL INFORMATION

CONFERENCE DATE AND VENUE

The 8th International Conference on Bridge Maintenance, Safety and Management – IABMAS 2016 will be held from June 26th to 30th, 2016 in Foz do Iguaçu, Brazil.

VENUE

BOURBON CATARATAS CONVENTION & SPA

Rodovia das Cataratas, 2345 - Km 2,5 - Foz do Iguaçu, Brazil.

Only 12 km from the Iguassu Falls – named one of the New 7 Nature Wonders -and 10 km from the Foz do Iguaçu International Airport, the Bourbon Cataratas occupies a total area of 165 thousand m². The hotel offers a complete structure for business and leisure in perfect harmony with the exuberant nature in the region.

REGISTRATION DESK

The registration desk will be located at the entrance of the Bourbon Cataratas Convention Center. Next to the registration desk will also work the Exhibitors Service Center (CAEX), to support sponsors and exhibitors of the event.

The registration desk will be open at the following hours:

Sunday	June 26th, 2016	13h00 – 18h00
Monday	June 27th, 2016	7h00 – 19h00
Tuesday	June 28th, 2016	7h00 – 19h00
Wednesday	June 29th, 2016	7h00 – 19h00
Thursday	June 30th, 2016	Not available

REGISTRATION FOR PARTICIPANTS INCLUDES:

Regular: Conference attendance, Proceedings (Book + CD Rom), Conference Bag, Welcome Reception, Lunches, Coffee Breaks, Gala dinner and Tour to Itaipu

Student: Conference attendance, Proceedings (Book + CD Rom), Conference Bag, Welcome Reception, Lunches, Coffee Breaks, Gala dinner and Tour to Itaipu. Students must provide a proof of their status to complete the registration.

Accompanying Persons: Welcome reception, Lunches, Coffee Breaks, Gala dinner and Tour to Itaipu.

INSTRUCTIONS FOR ORAL PRESENTATIONS

Presenters are allotted 15 minutes' total presentation time (15 minutes for the presentation and 5 minutes for discussions and questions). In an effort to synchronize the parallel sessions, session co-chairs have been instructed to retain a strict control of this time schedule. This is to allow participants to move from one session to another without missing anything of each presentation.

The official format of presentation is data projector using Microsoft Power Point. All presenters were instructed to bring their presentation on a USB memory stick and load their presentation at Media Desk. Presenters will not be allowed to connect their own computers to the data projectors at the conference.

It is the responsibility of the individual presenters (not the organizers) to ensure their presentations are uploaded at Media Desk at least 24 hours prior to the beginning of the session and to test them before uploading.

MEDIA DESK

Technicians will be available at the media desk (at Ipê I Room) to assist you with uploading your presentation to the correct session at the following times:

Sunday	June 26th, 2016	13h00 – 18h00
Monday	June 27th, 2016	7h00 – 19h00
Tuesday	June 28th, 2016	7h00 – 19h00
Wednesday	June 29th, 2016	7h00 – 18h00
Thursday	June 30th, 2016	Not available

GENERAL ASSEMBLY

IABMAS 2016 General Assembly is scheduled to happen on June 28th, from 18h30 to 20h30 at Cataratas I Room.

SOCIAL ACTIVITIES

WELCOME RECEPTION

June 26th, 2016

Place: Bourbon Cataratas Hotel – Convention Center Foyer

Time: 19h00 to 21h00

All registered delegates, accompanying persons and exhibitors are invited to an informal drink and good music in the Welcome Reception of IABMAS 2016. Drinks and Brazilian snacks will be served.

Dress: Casual - **Attendance to this reception is included in the registration fee.

GALA DINNER

June 29th, 2016

Place: Bourbon Cataratas Hotel – Rooms Cataratas I and II

Time: 20h00 to 00h00

A traditional local course will be served and guests will also enjoy a great Brazilian show, with dancers and the best Brazilian popular music.

Dress: Smart Casual - ** Attendance to this reception is included in the registration fee

VISITS TO ITAIPU BINACIONAL

Participants registered to IABMAS 2016 will be able to book a tour to Itaipu Binacional on June 27, 28, 29 and 30. Places are limited and the schedule can be done in the Registration Desk.

Please see below instructions to the visit:

- The visits leave at 7h00 and at 13h00 from the IABMAS 2016 Registration desk.
Please be at the meeting place 15 minutes in advance to not delay the departure of the tour.
- The duration of the visit is approximately 2 hours and 30 minutes.
- It is mandatory the use of closed shoes without heels and clothes with length below the knee during the Technical Visit.
- It is forbidden to enter with bags, backpacks or bags inside the plant. If necessary, we have lockers for rent. It is allowed to bring cameras, camcorders, mobile phones and notebooks to note.

7. GENERAL INFORMATION

OFFICIAL TRAVEL AGENCY

The Official Travel Agency of IABMAS 2016 is LEVITATUR VIAGENS.

The agency is present during IABMAS, near the registration desk, to help participants with accommodations, flight tickets and also sell tours through the city of Foz do Iguaçu.

LEVITATUR VIAGENS E TURISMO

Tel.: 55 11 2090 1030 | Fax: 55 11 2090 1039

www.levitatur.com.br

atendimento@levitatur.com.br

TOURS

Levitatur Viagens will be available for further information as price, groups and schedule of the tours. Please see below several options of tours in Foz do Iguaçu. Be sure to visit these incredible places of natural beauty!



CATARATAS – BRAZILIAN SIDE

The tour begins at the Iguazu National Park Visitors Center, and follows the lush vegetation of the park en route to the falls. The trail leading down to the gorge offers a wide view of over 240 different waterfalls. The walkways penetrate the drizzle of Devil's Throat, the biggest jumps. A panoramic lift up the face of the waterfalls that gives access to higher-viewpoint. The Iguazu National Park with the park of Argentina, form the most significant reserve of rainforest in the Southern Cone, declared a Natural World Heritage Site by UNESCO. In return, visit to a craft center.



CATARATAS – ARGENTINA SIDE

Cross Tancredo Neves Bridge with its beautiful view of the Iguazu River Canyon to reach Iguazu National Park in Argentina. Visit the upper walkways that provide a different view of the falls more closely and full nature orchids, bromeliads, birds and wildlife. The culmination of the visit is the lookout suspended the brink in the "Devil Throat" – most of all falls. This tour shows the major sight on the Argentina side.



MACUCO SAFARI

Also at the Iguazu National Park, you will find the Macuco Safari boat. A ride open and towed car, accompanied by expert guide. Runs 2km in the forest at reduced speed, hearing explanations and curiosities of the native fauna and flora. Finishing the passage, a journey on foot is made to reach the banks of the Iguazu River, where it leaves a motor boat, specially prepared that takes tourists to one of the most thrilling rides, where you have a close-up view of the Falls, listening to deafening sound of water. Along the way with emotion, the boat penetrates beneath the waterfall.



BIRD PARK

The Bird Park is located at the entrance of the Iguazu National Park and well integrated nature. The tour is done from inside of immense ponds and trails through lush jungle, where you can shoot and interact with hundreds of species of birds, snakes, alligators, monkeys and butterflies.

SAFETY

When traveling, as in any major city, take certain precautions. Do not carry valuables such as jewellery, airline tickets, money and important documents with you – it is advisable to leave them in a hotel safe deposit box. In the event your room key is lost or stolen notify the hotel management as soon as possible.

BANKS

Banks are open weekdays from 10am to 4pm; they are closed on weekends and public holidays. Automated teller machines (ATMs) can be found almost everywhere; some machines provide 24-hour cash withdrawal (R\$) facilities for major credit cards. There are ATMs available at the Foz do Iguaçu Airport, one inside Bourbon Hotel (HSBC Bank) and others at the gas station located on the corner of Av. das Cataratas with Av. Iguaçu.

CURRENCY

The Brazilian currency is the Real (R\$); there are 100 centavos in one Real. Brazilian coins come in denominations of 1 centavo (bronze); 5, 10, 25 and 50 centavos (silver) and a R\$ 1,00 coin (nickel and bronze). Bills come in denominations of R\$ 2, R\$ 5, R\$ 10, R\$ 20, R\$ 50 and R\$ 100.

The value of the real against the US dollar varies according to the daily exchange rate. Banks and exchange bureau charge a commission on exchange transactions, so visitors should enquire beforehand. As elsewhere, the rates of exchange for cash and traveler's checks are marginally different, and coins are not exchangeable. Money changers are obliged by law to display net rates of exchange. Receipts for Exchange must be issued by law; it is advisable to keep these until after departure.

ADDITIONAL TRAVEL INFORMATION

ELECTRICITY

The voltage is 110 volts in Foz do Iguaçu. Most hotels bathrooms also have a 220-volt socket.

TELECOMMUNICATIONS

Adjust your watch when you arrive. Foz do Iguaçu is 3 hours behind Greenwich Mean Time (GMT). Brazil is connected to all appropriate international telephone and satellite communications systems, providing trouble free connections to virtually anywhere in the world. Most hotels provide guest room International Direct Dial (IDD) services; some hotels have in-room internet hook-up and fax machines. Other offers this service through their Concierge or Business Centre. Outside hotels, long-distance calls can be made from IDD payphones or card phones in various locations. The push-button call-home system, providing immediate connection to the operator of the country required, is also available. For information about dialing access and IDD phone locations, contact the hotel operator. Not all local calls from private phones are free. However, shops, restaurants and bars without payphones will usually permit free use of their phones.

MEDICAL SERVICES

Most hotels have immediate access to on call 24-hour medical assistance. There are also many public and private hospitals with 24-hour emergency and out-patient departments. All hotels have a list of recommended medical services. During IABMAS 2016 we will have an ambulance available for any needs.

RESTAURANT TIPPING

When dining out, most establishments include a 10% service charge on the bill. However, it is customary to leave a little extra for good service.

WATER

The water supply in Foz do Iguaçu conforms to international standards. Nevertheless, it is advisable to drink only mineral water.

CLIMATE

The climate in Foz do Iguaçu is humid subtropical, reaching in summer temperature above 45 ° C in winter and reach a temperature below 5 °C.

INSURANCE

It is strongly recommended that participants take out adequate cover for health, travel and private liability insurance. The organizers cannot accept responsibility for personal injury, loss or damage to private property belonging to the symposium participants and accompanying persons.

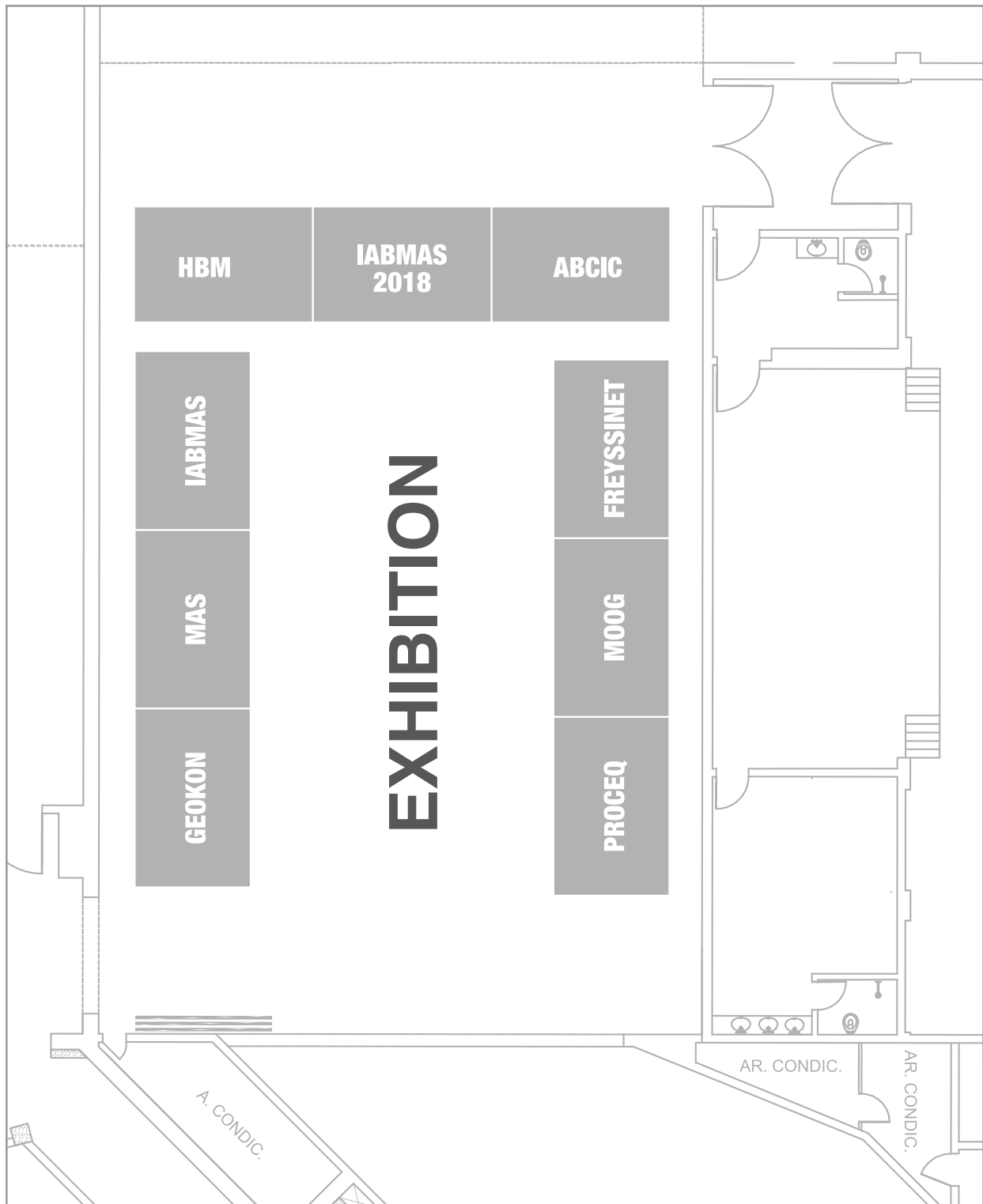
8. EXHIBITION

Participants will be able to visit the stands of IABMAS 2016 Exhibitors. Please see the schedule below.

June 27th – from 9:00 to 18:00

June 28th – from 9:00 to 18:00

June 29th – from 9:00 to 18:00



9. SPONSORS

FINANCIAL SUPPORT



CAPES

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior
Brazil



CNPq

Conselho Nacional de Desenvolvimento Científico e Tecnológico
Brazil



FAPESP

Fundação de Amparo à Pesquisa do Estado de São Paulo
Brazil

BRONZE SPONSORS



ABCIC

Associação Brasileira da Construção Industrializada de Concreto
Brazil



BDI



FREYSSINET

Sustainable Technology
France



GEOKON

Geotechnical and Structural Instrumentation
USA



HBM

HBM Test and Measurement
Germany



IBRACON

Instituto Brasileiro do Concreto
Brazil



MOOG GmbH

Germany



Permea TORR

Argentina



PROCEQ

Switzerland

10. PROGRAM AT A GLANCE

JUNE 26TH SUNDAY / JUNE 27TH - MONDAY

	JUNE 26TH	JUNE 27TH - MONDAY				ITAIPU BINACIONAL	
		IGUAZU I	IGUAZU III	CATARATAS I	CATARATAS II		
8:00 - 8:30				OPENING CEREMONY		ITAIPU Technical Visit 1 8h00	
8:30 - 9:00				T. Y. LIN LECTURE Dan M. Frangopol			
9:00 - 9:30				KN - Miguel Astiz			
9:30 - 10:00		COFFEE BREAK / EXHIBITION					
10:00 - 10:30		OS1 - GS Loading I (Earthquake, Accidental & other)	OS2 - GS Advanced Materials	OS3 - MS1 Life-Cycle Performance Assessment Of Existing Bridges In An Aggressive Environment	OS4 - SS1 Steel Bridge Rehabilitation		
10:30 - 11:00							
11:00 - 11:30							
11:30 - 12:00							
12:00 - 12:30		LUNCH / EXHIBITION					ITAIPU Technical Visit 2 14h00
12:30 - 13:00							
13:00 - 13:30	REGISTRATION			KN - Ronaldo C. Battista			
13:30 - 14:00							
14:00 - 14:30		OS5 - GS Loading II (Earthquake, Accidental & other)	OS6 - GS Assessment and Evaluation I	OS7 - MS10 A Rehabilitation, Strengthening And Management Of Bridges In Australia	OS8 - SS13 Bridge Networks: Maintenance, Safety, Reliability, Resilience, And Sustainability		
14:30 - 15:00							
15:00 - 15:30							
15:30 - 16:00							
16:00 - 16:30		COFFEE BREAK / EXHIBITION					
16:30 - 17:00		OS10 - GS Design Codes	OS11 - GS Diagnostics	OS12 - MS13 A Techniques Of Rehabilitation And Strengthening A Existing Bridges	OS13 - SS14 Monitoring And Evaluation Of Railway Bridges		
17:00 - 17:30							
17:30 - 18:00		OS14 - GS - Safety, Reliability and Serviceability	OS9 - GS - Aging and Deterioration Modeling				
18:00 - 18:30							
18:30 - 19:00							
19:00 - 19:30	WELCOME RECEPTION						
19:30 - 20:00							
20:00 - 20:30							
20:30 - 21:00							

10. PROGRAM AT A GLANCE

JUNE 28TH - TUESDAY

JUNE 28 TH - TUESDAY					
	IGUAZU I	IGUAZU III	CATARATAS I	CATARATAS II	ITAIPU BINACIONAL
8:00 - 8:30					ITAIPU Technical Visit 3 8h00
8:30 - 9:00	KN - Álvaro Cunha				
9:00 - 9:30	KN - Michel Ghosn				
9:30 - 10:00	COFFEE BREAK / EXHIBITION				
10:00 - 10:30	OS15 - GS Fatigue and Fracture Mechanics	OS16 - GS Field Testing	OS17 - MS14 Research And Applications In Bridge Health Monitoring I	OS18 - SS15 Bridge Maintenance And Strengthening - The Portuguese Experience	
10:30 - 11:00					
11:00 - 11:30	OS 46 - MS15 A Numerical Simulation Based Bridge Safety, Maintenance And Management				
11:30 - 12:00					
12:00 - 12:30	LUNCH / EXHIBITION				
12:30 - 13:00					
13:00 - 13:30					
13:30 - 14:00	KN - Naeem Hussain				
14:00 - 14:30	OS19 - GS Foundations	OS20 - GS Assessment and Evaluation II	OS22 - SS2 Aging Road Infrastructure - Challenges For Owners And Operators	OS21 - MS14 Research And Applications In Bridge Health Monitoring II And Sustainability	
14:30 - 15:00					
15:00 - 15:30	OS25 - GS Health Monitoring			OS23 - MS8 Structural Reliability Methods For Bridge Safety And Maintenance	OS24 - MS15 A Numerical Simulation Based Bridge Safety, Maintenance And Management
15:30 - 16:00					
16:00 - 16:30	COFFEE BREAK / EXHIBITION				
16:30 - 17:00	OS26 - GS Assessment and Evaluation III	OS27 - GS Life-Cycle Assessment	OS28 - MS16 Management Of Major Bridges For Resilience, Safety And Maintenance	OS29 - SS5 European Standardization Of Quality Specifications For Roadway Bridges	
17:00 - 17:30					
17:30 - 18:00					
18:00 - 18:30					
18:30 - 19:00					
19:00 - 19:30					
19:30 - 20:00	GENERAL ASSEMBLY				
20:00 - 20:30					

10. PROGRAM AT A GLANCE

JUNE 29TH - WEDNESDAY

JUNE 29 TH - WEDNESDAY						
	IGUAZU I	IGUAZU II	IGUAZU III	CATARATAS I	CATARATAS II	ITAIPU BINACIONAL
8:00 - 8:30						ITAIPU Technical Visit 5 8h00
8:30 - 9:00				KN - Carmelo Maiorana		
9:00 - 9:30				KN - Man-Chung Tang		
9:30 - 10:00	COFFEE BREAK / EXHIBITION					
10:00 - 10:30	OS30 - GS Maintenance Strategies, Repair and Replacement				OS33 - SS6 Bridges For High-Speed Railways	
10:30 - 11:00				OS32 - MS17 Bridge Foundations - Structural And Geotechnical Aspects		
11:00 - 11:30	OS35 - SS12 Accelerated Bridge Construction (Abc) - Innovations And Implementations		OS31 - GS Management Systems		OS34 - SS9 Â Development And Application Of Weigh-In-Motion (Wim) Technology For Bridge Structures	
11:30 - 12:00						
12:00 - 12:30	LUNCH / EXHIBITION					
12:30 - 13:00						
13:00 - 13:30						
13:30 - 14:00				KN - You-Lin Xu		
14:00 - 14:30			OS37 - GS Non-destructive Testing	OS38 - MS18 Advanced And Innovative Approaches To Bridge Management Including Risk Management/Risk Based Decision Making, Measuring And Reporting Performance, And New Bridge Management Approaches From Around The World	OS39 - GS Assessment and Evaluation IV	ITAIPU Technical Visit 6 14h00
14:30 - 15:00	OS36 - GS New Design Methods					
15:00 - 15:30			OS40 - MS7 Smart Bridge Structural Health Monitoring			
15:30 - 16:00						
16:00 - 16:30	COFFEE BREAK / EXHIBITION					
16:30 - 17:00	OS41 - GS Optimum Design / Optimization				OS44 - MS6 Novel Techniques Regarding The Assessment And Monitoring Of Bridges	
17:00 - 17:30			OS42 - GS Visual Inspections and Diagnostics	OS43 - MS2 Bridge Loading - Measurement And Modelling		
17:30 - 18:00	OS45 - GS Prediction of Future Traffic Demands					
18:00 - 18:30						
18:30 - 19:00				CLOSING CEREMONY		
19:00 - 19:30						
19:30 - 20:00						
20:00 - 00:00	GALA DINNER (20:00 / 00:00)					

10. PROGRAM AT A GLANCE

JUNE 30TH - THURSDAY

JUNE 30TH - THURSDAY		
		ITAIPU BINACIONAL
8:00 - 8:30	TOURS	ITAIPU Technical Visit 7 8h00
8:30 - 9:00		
9:00 - 9:30		
9:30 - 10:00		
10:00 - 10:30		
10:30 - 11:00		
11:00 - 11:30		
11:30 - 12:00		
12:00 - 12:30		
12:30 - 13:00		
13:00 - 13:30		
13:30 - 14:00		ITAIPU Technical Visit 8 14h00
14:00 - 14:30		
14:30 - 15:00		
15:00 - 15:30		
15:30 - 16:00		
16:00 - 16:30		
16:30 - 17:00		
17:00 - 17:30		
17:30 - 18:00		

11. SCIENTIFIC PROGRAM

JUNE 27TH - MONDAY

8:00 - 8:30 – OPENING CEREMONY

Room: Cataratas I

INVITED GUESTS

Airong Chen	<i>Tongji University, Shanghai, China</i>
André Teófilo Beck	<i>University of São Paulo, São Paulo, SP, Brazil</i>
Dan M. Frangopol	<i>Lehigh University Bethlehem, PA, USA</i>
Hyun-Moo Koh	<i>Seoul National University, Seoul, Korea</i>
Joan R. Casas	<i>Technical University of Catalonia, Barcelona, Spain</i>
Man-Chung Tang	<i>T.Y. Lin International, San Francisco, CA, USA</i>
Paulo Cruz	<i>University of Minho, Guimaraes, Portugal</i>
Pier Giorgio Malerba	<i>Politecnico di Milano, Milan, Italy</i>
Tulio Nogueira Bittencourt	<i>University of São Paulo, São Paulo, SP, Brazil</i>

8:30 - 9:00 - T. Y. LIN LECTURE

Room: Cataratas I

Session Chair: André Teófilo Beck

Bridge Life-Cycle Performance and Cost: Analysis, Prediction, Optimization and Decision Making

Dan M. Frangopol - Lehigh University Bethlehem, PA, USA

The development of the bridge life-cycle performance and cost approach, with emphasis on analysis, prediction, optimization, and decision making under uncertainty, is briefly reviewed. The central issue underlying the importance of the life-cycle approach to bridge engineering is the need for a rational basis for making informed decisions regarding design, construction, inspection, monitoring, maintenance, repair, rehabilitation, replacement, and management of bridges under uncertainty by using multi-objective optimization in order to balance conflicting criteria such as performance and cost. A number of significant developments are summarized, including time-dependent reliability, resilience, risk, and sustainability of bridges and bridge transportation networks, in a life-cycle perspective. Finally, some of the future challenges are identified and suggestions for further development are provided.

9:00 - 9:30 – KEYNOTE LECTURE

Room: Cataratas I

Session Chair: Tulio Nogueira Bittencourt

Towards a standard policy for structural monitoring in cable-stayed bridges

Miguel Astiz - Polytechnic University of Madrid (UPM) & Carlos Fernández Casado S.L. (CFC), Madrid, Spain

Cable-stayed bridges are complex structures which need to be monitored during service life. Requirements for monitoring vary between the different owners and indicate what are their main worries with respect to such bridges. On the basis of previous experiences some unified policies are being proposed to define monitoring requirements after taking into account not only the variables which may be more relevant to the structural behaviour but also those whose possible changes during service life are more significant. The structural parameters which are being considered are related to deck and cables vibrations, deck displacements, deck and pylons temperatures.

JUNE 27TH, 2016

10:00 - 12:00 - ORAL SESSION 01

Room: Iguazu I

Session Chair: Koji Kinoshita

**GENERAL SESSION - Loading I
(Earthquake, Accidental & other)**

10:00 - 10:15

213 - ANALYSIS OF SEISMIC PERFORMANCE OF CORRODED REINFORCED CONCRETE BRIDGE PIERS
CONGQI FANG

10:15 - 10:30

140 - ANALYTICAL STUDY OF THE COLLAPSE PROCESS IN AN EXISTING SUSPENSION BRIDGE IN THE EVENT OF A MAJOR EARTHQUAKE
HIROSHI MATSUDA

10:30 - 10:45

227 - DIFFERENT APPROACHES TO THE SEISMIC ANALYSIS OF RC BRIDGES
TATJANA ISAKOVIC

10:45 - 11:00

115 - INVESTIGATION OF FATIGUE IN STEEL H-PILES OF INTEGRAL BRIDGES SUBJECTED TO INTENSE SEISMIC GROUND MOTIONS
MURAT DICLELI

11:00 - 11:15

183 - PRE-TEST STUDIES ON SEISMIC SOIL-ABUTMENT INTERACTION IN SKEWED BRIDGES
MEHDI SAIIDI

11:15 - 11:30

47 - SEISMIC ANALYSIS OF ABUTMENTS ON BRIDGES STRENGTHENED BY THE METHOD OF TIED-ARCH
MATÍAS A. VALENZUELA

11:30 - 11:45

304 - SEISMIC ANALYSIS OF RC COLUMN SCALED MODEL CONSIDERING STRAIN DISTORTION
JAMIN PARK

11:45 - 12:00

228 - THE INFLUENCE OF STIRRUPS' DESIGN TO THE BUCKLING OF THE FLEXURAL REINFORCEMENT IN FLANGED BRIDGE COLUMNS SUBJECTED TO CYCLIC LOAD
TATJANA ISAKOVIC

10:00 - 12:00 - ORAL SESSION 02

Room: Iguazu III

Session Chair: Leandro F. M. Sanchez

**GENERAL SESSION
Advanced Materials**

10:00 - 10:15

36 - BEHAVIOR OF BRIDGE DECKS UNDER DRYING SHRINKAGE USING LARGE-SCALE TESTING
RIYADH HINDI

10:15 - 10:30

448 - EVALUATION OF MATERIAL MODELS FOR POLYMERIC COMPONENTS IN MODULAR BRIDGE EXPANSION JOINT SYSTEMS
FRANK ARTMONT

10:30 - 10:45

421 - RELIABILITY-BASED LIFE-CYCLE ANALYSIS OF FRP STRENGTHENING FOR RC BRIDGE GIRDERS
YINAN YANG

10:45 - 11:00

511 - SOLUTION TO HYDRATION HEAT PROBLEM
MARIA KASZYNSKA

11:00 - 11:15

682 - SUSTAINABLE STRENGTHENING OF RC MEMBERS WITH HIGH PERFORMANCE CONCRETE OVERLAYS
NORBERT RANDL

11:15 - 11:30

59 - TENSILE BEHAVIOR BY WEIBULL ANALYSIS IN BINARY, TERNARY AND QUATERNARY CONCRETES DESIGNED WITH MICRO AND NANO-SILICA ADDITIONS
LUIS EDUARDO ZAPATA

11:30 - 11:45

270 - SELF-CENTERING BRIDGE COLUMN WITH CFRP TENDONS UNDER SEISMIC LOADS
MEHDI SAIIDI

11:45 - 12:00

624 - NO-CEMENT ECO-BINDER AS A POTENTIAL MATERIAL FOR BRIDGE CONSTRUCTION
TA-PENG CHANG

JUNE 27TH, 2016

10:00 - 12:00 - ORAL SESSION 03

Room: Cataratas I

Session Chairs: Mitsuyoshi Akiyama and Ikumasa Yoshida

**MINI-SYMPOSIA 1 - Life-Cycle Performance
Assessment of Existing Bridges in an Aggressive
Environment**

10:00 - 10:15

**427 - ANALYTICAL AND EXPERIMENTAL
SERVICE LIFE ASSESSMENT OF
HONG KONG-ZHUHAI-MACAU LINK**
ROBERTO JUAN TORRENT

10:15 - 10:30

**426 - CARBONATION RATE IN OLD
STRUCTURES ASSESSED WITH
AIR-PERMEABILITY SITE NDT**
ROBERTO JUAN TORRENT

10:30 - 10:45

**479 - COST-BASED RECOVERY PROCESSES
AND SEISMIC RESILIENCE OF AGING BRIDGES**
ANDREA TITI

10:45 - 11:00

**340 - GROUPING AND ESTIMATION OF
DETERIORATION CURVES OF
EXISTING BRIDGES**
IKUMASA YOSHIDA

11:00 - 11:15

**31 - PARTIAL FACTORS FOR RELIABILITY-BASED
DURABILITY ASSESSMENT OF RC BRIDGES USING
OBSERVATIONAL DATA**
MITSUYOSHI AKIYAMA

11:15 - 11:30

**264 - USING CALIBRATED PROBABILISTIC
DETERIORATION INFORMATION TO OPTIMIZE
THE REHABILITATION SCHEDULE OF BRIDGES**
FILIPPOS ALOGDIANAKIS

10:00 - 12:00 - ORAL SESSION 04

Room: Cataratas II

Session Chairs: Masahiro Sakano and
José Luiz Antunes de Oliveira e Sousa

**SPECIAL SESSION 1
Steel Bridge Rehabilitation**

10:00 - 10:15

**130 - A STRENGTHENING THEORY TO
PREVENT FATIGUE CRACK INITIATION
IN OLD METALLIC BRIDGES**
ELYAS GHAFoori

10:15 - 10:30

**433 - ENHANCING LOW-CYCLE FATIGUE
STRENGTH OF CRUCIFORM WELDED
JOINTS BY WELD TOE GRINDING**
KOJI KINOSHITA

10:30 - 10:45

**385 - FATIGUE STRENGTH IMPROVEMENT BY
PEENING FROM BACK SURFACE OF WELD TOE**
RISA MATSUMOTO

10:45 - 11:00

**380 - FATIGUE STRENGTH IMPROVEMENT
OF RIB-TO-DECK JOINTS OF ORTHOTROPIC
STEEL DECK BY PEENING**
TOSHIYUKI ISHIKAWA

11:00 - 11:15

**594 - IMPROVING THE DURABILITY OF EXISTING
ORTHOTROPIC STEEL DECKS USING STEEL
PLATES AND STUD BOLTS**
AKINORI SATO

11:15 - 11:30

**342 - RATIONALIZATION OF FATIGUE CRACKS
INSPECTIONS IN STEEL BRIDGES THROUGH
APPLICATION OF EDDY CURRENT TESTS**
LUIZA HIROKO ICHINOSE

11:30 - 11:45

**653 - REPLACEMENT OF CABLE STAYS
ON TJÖRN BRIDGE**
JAKOB LAIGAARD JENSEN

11:45 - 12:00

**79 - A STUDY ON REPAIR METHOD
USING TRS FOR FATIGUE CRACKS IN
ORTHOTROPIC STEEL DECK**
YOSHIKI MIZOKAMI

JUNE 27TH, 2016

13:30 - 14:00 – KEYNOTE LECTURE

Room: Cataratas I

Session Chair: André Teófilo Beck

Bridge Dynamics and Aerodynamics: Design and Practical Requirements for High Structural Performance and Safety

Ronaldo C. Battista, Full Professor, Structural Engineering, Instituto COPPE/UFRJ, Director of Controllato Ltd. – Rio de Janeiro, RJ, Brazil.

Bridge dynamics and aerodynamics have been in many cases overlooked in the design stages and consequent low behavior performance and safety margin have been not rarely observed and detected by means of measurements soon after the bridge is brought into full service. The above statement serves for any type of bridge structure – constructed with any conventional or non-conventional and composite material – having a considerable slenderness ratio typical of modern bridge's structures.

Design and practical requirements for a high structural performance and safety are pointed out and discussed. Case examples of actual bridges subjected to dynamic forces produced by the traffic of heavy vehicles and by the wind action are explored to show the observed misbehavior and the faults which had their origin in one or a combination of some of the following main sources of problems:

1. Computational modeling of the structural system;
2. Mathematical modeling of the forces produced by the dynamic interaction between vehicles, pavement and the deck structure;
3. Mathematical models of the aerodynamic forces and lack of wind tunnel tests of reduced scale models for obtaining aerodynamic and aeroelastic coefficients to be taken into the mathematical models;
4. Lack of detailed numerical modeling and poor geometrical design of structural components and their connections which is needed to perform sensitivity analyses of stress concentration points;
5. Lack of proper fatigue analyses of these connections and components; etc.

Another relevant practical aspect worth to bring about for discussion is the lack of comprehensive short term dynamic monitoring of the overall structural behavior and also of the variation of forces and stresses in the main components of the bridge, as soon as it is brought into service. The analysis of the collected data is fundamental to verify if: (i) the structure and its foundations have been built according to the design drawings; (ii) or instead, the theoretical models employed in the design calculations were not appropriate, leading to the observed misbehavior and faults. The full understanding of the detected problems is then essential to mitigate design and construction errors and to rehabilitate the structural system, in order it may fulfill the established requirements for a good structural performance and safety.

The relevance and usefulness of dynamic control systems and long term monitoring in improving structural performance and safety are also briefly discussed.

JUNE 27TH, 2016

14:00 - 16:00 - ORAL SESSION 05

Room: Iguazu I

Session Chairs: Hyun-Moo Koh, Sunyong Kim and Arthur Medeiros

**GENERAL SESSION - Loading II
(Earthquake, Accidental & other)**

14:00 - 14:15

97 - RESEARCH ON THE SEISMIC DESIGN STRATEGY OF SELF-ANCHORED SUSPENSION BRIDGE

YANG ZHANG

14:15 - 14:30

402 - GENERATION OF A TIME-HISTORY GRAPH OF ACCELERATIONS FROM A DESIGN SPECTRUM

PATRÍCIA MURAD QUINTERO

14:30 - 14:45

197 - INFLUENCE OF SEISMIC CODE UPDATES ON THE DYNAMIC RESPONSE OF EXISTING BRIDGES IN ROMANIA

IONUT RADU RACANEL

14:45 - 15:00

496 - APPLICATION OF HYBRID SIMULATION FOR SEISMIC ASSESSMENT AND RETROFITTING OF RC ELEMENTS USING MULTI-AXIS SUBSTRUCTURE TESTING (MAST) SYSTEM

RIADH AL-MAHAIDI

15:00 - 15:15

46 - SHEAR AND MOMENT CAPACITY OF THE RUYTENSCHILDT BRIDGE

KAREN PATRICIA FLORES

14:00 - 16:00 - ORAL SESSION 06

Room: Iguazu III

Session Chairs: Balthasar Novák and Leila Cristina Meneghetti

**GENERAL SESSION
Assessment and Evaluation I**

14:00 - 14:15

57 - ANALYSIS OF EXTERIOR BRIDGE GIRDER ROTATION DUE TO ECCENTRIC CONSTRUCTION LOADING USING TAEG SOFTWARE

MD ASHIQUZZAMAN

14:15 - 14:30

258 - ASSESSMENT OF THE CONSERVATION STATUS AND SUGGESTIONS OF ALTERNATIVES TO THE REHABILITATION OF MARCOS KONDER BRIDGE, AT ITAJAÍ-SC, BRAZIL.

KATHERINE CASTANHA JORDÃO

14:30 - 14:45

16 - MOVEABLE STEEL BRIDGE DESIGN AGAINST DAMAGE PREVENTION: A COMPREHENSIVE APPROACH

ALESSIO PIPINATO

14:45 - 15:00

257 - DEVELOPMENT OF ROBUST COMPUTATIONAL CODE FOR STEEL RAILROAD BRIDGE RATING

DAVID W. JACOBS

15:00 - 15:15

268 - EFFECT OF TRANSVERSE LOAD DISTRIBUTION ON THE INFLUENCE LINES GIVEN BY A BRIDGE WEIGH IN MOTION SYSTEM

SABRINA KALISE HEINEN

15:15 - 15:30

519 - EXPERIMENTAL STUDY ON BENDING BEHAVIOR FOR INNOVATIVE HOLLOW TUBULAR FLANGE COMPOSITE GIRDERS

CHUN SHENG WANG

15:30- 15:45

160 - EVALUATION OF BRIDGE BEARING PERFORMANCE BASED ON THE FIELD MEASUREMENT

NAHO SHIBASAKI

15:45 - 16:00

141 - AN EXAMINATION OF THE SEISMIC PERFORMANCE OF ROCKER PIER BRIDGES IN JAPAN'S OLDEST EXPRESSWAY

SHUICHI RI

JUNE 27TH, 2016

14:00 - 16:00 - ORAL SESSION 07

Room: Cataratas I

Session Chairs: Nigel Powers and Riadh Al-Mahaidi

MINI-SYMPOSIA - MS10 - A Rehabilitation, Strengthening And Management Of Bridges In Australia

14:00 - 14:15

593 - BRIDGE EVALUATION AND STRENGTHENING FOR INCREASED VEHICLE LOADS IN NEW ZEALAND
JOHN REYNOLDS

14:15 - 14:30

619 - DURABILITY OF FRP STRENGTHENED REINFORCED CONCRETE FLEXURAL MEMBERS FOR BRIDGE STRUCTURES
REBECCA JANE GRAVINA

14:30 - 14:45

481 - EXPERIMENTAL INVESTIGATION ON CFRP STRENGTHENED STEEL PLATES WITH INCLINED CRACKS
NAZAR JABER ALJABAR

14:45 - 15:00

597 - IMPROVING THE BOND PERFORMANCE OF FRP APPLIED TO RC BRIDGES USING MECHANICAL SUBSTRATE STRENGTHENING AND FRP SPIKE ANCHORS
RIADH AL-MAHAIDI

15:00 - 15:15

109 - PRACTICAL RISK BASED APPROACH TO DETERMINE FLOOD IMPACT
NIGEL GLENN POWERS

15:15 - 15:30

126 - TORSIONAL STRENGTHENING OF CONCRETE BRIDGE GIRDERS USING THE NSM FRP
GHAIK AL-BAYATI

15:30 - 15:45

308 - ANALYSIS OF FLOOD IMPACT ON REINFORCED CONCRETE GIRDER BRIDGES – A CASE STUDY
MOHAMED FAROOK KALENDHER LEBBE

15:45 - 16:00

467 - CFRP CONFINEMENT OF CONCRETE COLUMNS DAMAGED BY HIGH EXPANSION LEVEL OF ALKALI-AGGREGATE REACTION
GHAIK AL-BAYATI

14:00 - 16:00 - ORAL SESSION 08

Room: Cataratas II

Session Chairs: Paolo Bocchini, Matteo Pozzi and Sofia Maria Carrato Diniz

SPECIAL SESSION - SS13 - Bridge Networks: Maintenance, Safety, Reliability, Resilience, and Sustainability

14:00 - 14:15

387 - SEISMIC RESILIENCE OF AGING BRIDGES AND TRANSPORTATION NETWORKS
FABIO BIONDINI

14:15 - 14:30

62 - MAINTENANCE AND SEISMIC RETROFIT COST ASSESSMENT OF EXISTING BRIDGES
MARIANO ANGELO ZANINI

14:30 - 14:45

676 - SEISMIC LOSS ASSESSMENT OF DETERIORATING BRIDGE NETWORKS
MARIANO ANGELO ZANINI

14:45 - 15:00

252 - METRICS AND ALGORITHM FOR OPTIMAL RETROFIT STRATEGY OF RESILIENT TRANSPORTATION NETWORKS
PAOLO BOCCHINI

15:00 - 15:15

464 - SENSITIVITY OF NETWORK-LEVEL SEISMIC PERFORMANCE MEASURES TO THE AVAILABLE BRIDGES INFORMATION
FRANCESCO CAVALIERI

15:15 - 15:30

237 - VALUE OF INFORMATION ANALYSIS FOR TYPICAL BRIDGE NETWORK TOPOLOGIES
MATTEO POZZI

15:30 - 15:45

649 - IMPROVE THE SUSTAINABILITY OF A BRIDGE DURING THE RETROFITTING
MIGUEL MUNOZ MACHICAO

JUNE 27TH, 2016

16:30 - 17:45 - ORAL SESSION 10

Room: Iguazu I

Session Chairs: Pier Giorgio Malerba
and Antonio Laranjeiras

GENERAL SESSION - Design Codes

16:30 - 16:45

76 - BRIDGES IN JUIZ DE FORA CITY
MARIA TERESA GOMES BARBOSA

16:45 - 17:00

**172 - FAILURE ANALYSIS AND MAINTENANCE
PROPOSAL FOR THE BRIDGE OVER “QUEBRADA
DE TAMBURA (IMBABURA-ECUADOR)”**
KAREN PATRICIA FLORES

17:00 - 17:15

**646 - UPDATE IN VALUES OF TRAFFIC EFFECTS
ON BRAZILIAN SHORT SPAN BRIDGES**
CARLOS EDUARDO ROSSIGALI

17:15 - 17:30

**579 - COMPARATIVE STUDY AMONG HYBRID
(STEEL & CONCRETE) AND PRE-STRESSED
CONCRETE IN THE DIMENSIONING OF
A RAILROAD BRIDGE SUPERSTRUCTURE**
GLAUCO JOSÉ DE OLIVEIRA RODRIGUES

16:30 - 17:45 - ORAL SESSION 11

Room: Iguazu III

Session Chairs: Miguel Astiz
and Leila Cristina Meneghetti

GENERAL SESSION - Diagnostics

16:30 - 16:45

**424 - BRIDGE MANAGEMENT SYSTEM FOR THE
DIRECCIÓN DE VIALIDAD DE LA PROVINCIA DE
BUENOS AIRES**
DIEGO JAVIER CERNUSCHI

16:45 - 17:00

**11 - BRIDGE PERFORMANCE MEASURES:
ROBUSTNESS - REDUNDANCY**
PETER MCCARTEN

17:00 - 17:15

**19 - FATIGUE ANALYSIS OF PRESTRESSED
CONCRETE BRIDGES: ANALYSIS,
ASSESSMENT AND RETROFIT**
ALESSIO PIPINATO

17:15 - 17:30

**71 - SIMULTANEOUS SUBSTITUTION TWO STEEL
BRIDGES LATTICE IN EFC**
ALBERTO MARTINS SANTOS FILHO

17:30 - 17:45

**149 - ASSET MANAGEMENT FRAMEWORK
CONSIDERING CLIMATE CHANGE IMPACTS
AND TRAFFIC GROWTH**
EUGENE O'BRIEN

JUNE 27TH, 2016

16:30 - 18:30 - ORAL SESSION 12

Room: Cataratas I

Session Chairs: Júlio Timerman and Roberto C. A. Pinto

MINI-SYMPOSIA - MS13 - A Techniques of Rehabilitation and Strengthening a Existing Bridges

16:30 - 16:45

173 - STRENGTHENING OF THE CHILLON HIGHWAY VIADUCT DECK SLAB WITH REINFORCED UHPFRC

EUGEN BRÜHWILER

16:45 - 17:00

540 - DETERMINATION OF FIBRE CONTENT AND ORIENTATION IN UHPFRC LAYERS USING NDT FOR PREDICTING THE BEHAVIOUR OF STRENGTHENED BEAMS

MÁRIO PIMENTEL

17:00 - 17:15

129 - FATIGUE STRENGTHENING OF RIVETED GIRDERS IN A HISTORIC RAILWAY METALLIC BRIDGE IN SWITZERLAND USING PRE-STRESSED UN-BONDED CFRP LAMINATES

ELYAS GHAFoori

17:15 - 17:30

685 - STRENGTHENING AN EXISTING BRIDGE USING EXTERNAL TENDONS – CASE – SAMAMBAIAS RIVER/PR

ALAIN BERTRAND

17:30 - 17:45

124 - CARBON-FIBER REINFORCED POLYMER USED IN THE REINFORCEMENT OF RECTANGULAR OPENINGS IN THE WEB OF REINFORCED CONCRETE BEAMS

EDSON ELIAS MATAR

17:45 - 18:00

684 - SUITABILITY OF BRIDGES FOR TIETE-PARANA WATERWAY NAVIGATIONAL CLEARANCE

MARCIO MELLO FREIRE

18:00 - 18:15

686 - SÃO VICENTE SUSPENSION BRIDGE REHABILITATION AND CABLE SUBSTITUTION

RAFAEL TIMERMAN

18:15 - 18:30

155 - THE EXISTING BRIDGE'S SAFETY

FERNANDO REBOUÇAS STUCCHI

16:30 - 18:30 - ORAL SESSION 13

Room: Cataratas II

Session Chairs: Eui-Seung Hwang and Hani Nassif

SPECIAL SESSION - SS14 - Monitoring and Evaluation of Railway Bridges

16:30 - 16:45

508 - CHARACTERISTICS OF LIVE LOAD FOR RAILWAY BRIDGES BASED ON STATISTICAL ANALYSIS OF WIM DATA

INYEOL PAIK

16:45 - 17:00

222 - DEFLECTION AND ACCELERATION MEASUREMENTS FOR HIGH SPEED RAILWAY BRIDGES

EUI-SEUNG HWANG

17:00 - 17:15

601 - DETERIORATION AND ASSESSMENT OF STEEL BRIDGES

PAVEL RYJACEK

17:15 - 17:30

178 - EXPERIMENTAL INVESTIGATION ON THE BEAM-SLAB CONNECTION BEHAVIOR OF A DAMAGED REAL RAILWAY BRIDGE

ALFREDO PINTO DA CONCEICAO NETO

17:30 - 17:45

174 - LONG TERM MONITORING OF TRAFFIC ACTION EFFECT OF A SHORT SPAN RC RAILWAY UNDERPASS FOR SAFETY EXAMINATION

EUGEN BRÜHWILER

17:45 - 18:00

494 - RELIABILITY ANALYSIS OF PSC-I GIRDER RAILWAY BRIDGE BASED ON MEASURED TRAIN AXLE LOADS

INHO YEO

18:00 - 18:15

634 - FATIGUE ASSESSMENT OF CENTENARIAN RAILWAY BRIDGES

HANI H NASSIF

18:15 - 18:30

635 - EVALUATION AND LOAD RATING OF RAILROAD BRIDGES BASED ON STRUCTURAL HEALTH MONITORING (SHM)

HANI H NASSIF

JUNE 27TH, 2016

17:45 - 18:30 - ORAL SESSION 14

Room: Iguazu I

Session Chairs: Antonio A. Henriques and Sofia Maria Carrato Diniz

GENERAL SESSION - Safety, Reliability and Serviceability

17:45 - 18:00

614 - CASE STUDY - NONLINEAR RELIABILITY ANALYSIS OF A CONCRETE BRIDGE

DRAHOMIR NOVAK

18:00 - 18:15

244 - STUDYING THE SPECTRAL BEHAVIOR OF CONCRETE FOR EVALUATION NON-DESTRUCTIVELY OF RESISTANCE IN SITU

PAOLA GORKOS

17:45 - 18:30 - ORAL SESSION 09

Room: Iguazu III

Session Chairs: Fabio Biondini, Roberto Torrent and Enson Portela

**GENERAL SESSION
Aging and Deterioration Modeling**

17:45 - 18:00

162 - INFLUENCE OF SPATIO-TEMPORAL EFFECTS OF CORROSION ON MEMBRANE ACTION IN REINFORCED CONCRETE SLABS

WOUTER BOTTE

18:00 - 18:15

396 - REMAINING STRENGTH EVALUATION METHOD OF PLATE GIRDERS WITH CORRODED FLANGE UNDER SLEEPERS

KATASHI FUJII

18:15 - 18:30

151 - TIME-DEPENDENT PROBABILISTIC MODELING OF CORROSION PROPAGATION FOR SERVICE LIFE PREDICTION IN RC STRUCTURES

ENSON LIMA PORTELA

JUNE 28TH - TUESDAY

8:30 - 9:00 – KEYNOTE LECTURE

Room: Cataratas I

Session Chair: André Teófilo Beck

Dynamic Identification and Continuous Dynamic Monitoring of Bridges

Álvaro Cunha - University of Porto, Porto, Portugal

This lecture makes an overview on relevant aspects related with the dynamic identification and continuous dynamic monitoring of bridges and large span structures, stressing their potential at different stages of bridges' life-cycle.

This involves, in a first instance, a characterization of the evolution of perspectives concerning testing techniques, instrumentation, modal identification, mitigation of environmental effects on modal variability estimates and vibration based damage detection. Subsequently, a representative set of dynamic tests and monitoring applications developed by the Laboratory of Vibrations and Structural Monitoring (VIBEST, www.fe.up.pt/vibest) of FEUP on relevant roadway, railway and pedestrian bridges are presented, showing the efficiency of the developed tools and the usefulness of the testing and monitoring programs implemented, enabling the achievement of different objectives, such as:

- . the development of finite element model correlations and updating;
- . the vibration serviceability safety checking, particularly in case of lively bridges involving the inclusion of vibration control devices;
- . the implementation of automated versions of the most powerful methods of Operational Modal Analysis, and their application for tracking the time evolution of modal parameters in long-term dynamic monitoring applications;
- . the application of statistical methods to remove or mitigate the influence of environmental and operational factors (e.g. temperature, intensity of traffic, wind) on the modal variability, supporting the development of reliable techniques for vibration based damage detection;
- . the experimental assessment of fatigue, based on the measurement of effects of real traffic loads;
- . and the experimental assessment of aerodynamic problems in bridges based on in-situ measurements.

9:00 - 9:30 – KEYNOTE LECTURE

Room: Cataratas I

Session Chair: Tulio Nogueira Bittencourt

Implementation of System Performance Principles in Bridge Assessment and Design

Michel Ghosn - The City College of New York/CUNY, New York, NY, USA

Current bridge design and assessment practices remain primarily focused on evaluating the strength and serviceability of individual structural members and components. While this traditional member oriented approach has led to the design of safe bridge infrastructure networks, it is widely recognized that the approach does not necessarily lead to an accurate evaluation of the actual structural safety levels nor to the efficient utilization of limited resources when making decisions related to the management of existing deteriorating structures, especially those that may be exposed to extreme events. For this reason, there is renewed interest in developing system-level assessment methods as a basis to modern bridge safety evaluation and design processes.

This presentation reviews recent proposals for developing and implementing system performance criteria in bridge engineering. The presentation reviews established concepts of reliability-based design along with emerging ideas of performance- and resilience-based design that are especially relevant for assessing and managing system-level risk. The presentation also addresses the establishment of structural redundancy and robustness metrics as well as network based ranking criteria. Insights from these reviews emphasize the need to transition bridge design and safety assessment processes from the traditional component-level approach to one that seeks uniform levels of risk across scales (from structural systems to infrastructure networks). Examples are provided to illustrate the implementation of these concepts in bridge engineering practice.

JUNE 28TH, 2016

10:00 - 10:45 - ORAL SESSION 15

Room: Iguazu I

Session Chair: Eugen Brühwiler and Túlio N. Bittencourt

GENERAL SESSION

Fatigue and Fracture Mechanics I

10:00 - 10:15

379 - DURABILITY LIMIT STATES AND RELIABILITY ANALYSIS OF CONCRETE COMPONENTS IN LONG-SPAN BRIDGE

PU WEI

10:15 - 10:30

51 - NUMERICAL STUDY TO INVESTIGATE WEB-GAP DISTORTION OF AN EXISTING RETROFITTED BRIDGE

RIYADH HINDI

10:30 - 10:45

93 - DETERMINATION OF UNCERTAIN DESIGN PARAMETERS OF POST-TENSIONED COMPOSITE BRIDGE

DAVID LEHKÝ

10:00 - 12:00 - ORAL SESSION 16

Room: Iguazu III

Session Chairs: Ronaldo Carvalho Battista and Álvaro Cunha

GENERAL SESSION - Field Testing

10:00 - 10:15

638 - DEFLECTION AND VIBRATION MONITORING FOR SERVICEABILITY OF ROAD BRIDGES

EUI-SEUNG HWANG

10:15 - 10:30

617 - ESTIMATION OF CONCRETE COMPRESSIVE STRENGTH THROUGH ULTRASONIC WAVES WITH DIFFERENT FREQUENCIES APPLIED TO A CONCRETE BRIDGE

FLAVIO BARBOZA LIMA

10:30 - 10:45

246 - FIRE ON AZIENKOWSKI BRIDGE - 423 M LONG STEEL BRIDGE WITH AN ORTHOTROPIC DECK

HENRYK ZOBEL

10:45 - 11:00

286 - LITERATURE REVIEW OF CONDITIONS AND METHODS OF REPAIRING CONCRETE BRIDGES

CLAUDIO CESAR WAJDOWICZ

11:00 - 11:15

444 - LONG-TERM CORROSION BEHAVIOR OF BRIDGES: CASE STUDIES

IOAN PEPENAR

11:15 - 11:30

191 - SEISMIC VULNERABILITY OF RETROFITTED BRIDGES

JOSE M JARA

11:30 - 11:45

278 - DETECTION OF CRACKS AND LOSS OF MASS IN CONCRETE THROUGH 3D POINT CLOUDS GENERATED BY TERRESTRIAL LASER SCANNER

PAOLA GORKOS

11:45 - 12:00

166 - OVERALL ASSESSMENT OF AN ASR AFFECTED VIADUCT "ROBERT-BOURASSA/ CHAREST" AFTER NEARLY 50 YEARS IN SERVICE

LEANDRO F. M. SANCHEZ

JUNE 28TH, 2016

10:00 - 12:00 - ORAL SESSION 17

Room: Cataratas I

Session Chairs: Joan Casas and Hitoshi Furuta

MINI-SYMPOSIA - MS14 - Research and Applications in Bridge Health Monitoring I

10:00 - 10:15

329 - AN INNOVATION MONITORING METHOD OF VEHICLE INDUCED AERODYNAMIC LOAD ON SOUND BARRIER INTEGRATED WITH PHOTOGRAMMETRY AND IMAGE ANALYSIS

DALEI WANG

10:15 - 10:30

409 - APPLICATION OF A CROSS CORRELATION TECHNIQUE FOR ASSESSMENT OF A NON-HOMOGENEOUS STRESS FIELD

JOSÉ LUIZ ANTUNES DE OLIVEIRA E SOUSA

10:30 - 10:45

374 - DATA MINING AND ANALYSIS OF LARGE-SCALE BRIDGE STRUCTURE HEALTH MONITORING

HAO TIAN

10:45 - 11:00

177 - DEVELOPMENT OF A WEB INTERFACE FOR STRUCTURAL HEALTH MONITORING DATA VISUALIZATION AND STRUCTURAL PERFORMANCE ASSESSMENT

ALBERTO BELOTTI COLOMBO

11:00 - 11:15

545 - MONITORING OF THE INFANTE D. HENRIQUE BRIDGE WITH SELF ORGANIZING MAPS

MARÍLIA MARCY

11:15 - 11:30

394 - ON THE USE OF A PASSING VEHICLE FOR BRIDGE HEALTH MONITORING

EUGENE J. OBRIEN

11:30 - 11:45

181 - RELIABILITY EVALUATION OF REINFORCED CONCRETE BRIDGES USING STRUCTURAL HEALTH MONITORING

ALBERTO BELOTTI COLOMBO

11:45 - 12:00

85 - MONITORING OF FLEXURAL AND SHEAR CRACKING IN PARTIALLY PRESTRESSED CONCRETE BEAMS BY DISTRIBUTED OPTICAL FIBER

JOAN R CASAS

10:00 - 11:00 - ORAL SESSION 18

Room: Cataratas II

Session Chair: Paulo Cruz

SPECIAL SESSION - SS15 - Bridge Maintenance and Strengthening - The Portuguese Experience

10:00 - 10:15

539 - EXPERIMENTAL ASSESSMENT OF THE COMPONENTS AND MATERIALS OF STONE ARCH RAILWAY BRIDGES

ANTONIO AREDE

10:15 - 10:30

437 - EXTENDING THE LIFE OF CENTENARY STEEL BRIDGES

PAULO CRUZ

10:30 - 10:45

77 - TESTS OF A RAILWAY BRIDGE BEFORE AND AFTER PRE-STRESSING OF STRENGTHENING BARS

JORGE RODRIGUES

10:45 - 11:00

538 - TRAIN-BRIDGE DYNAMIC INTERACTION ON A STONE MASONRY RAILWAY BRIDGE

PEDRO JORGE

JUNE 28TH, 2016

10:45 - 12:00 - ORAL SESSION 46

Room: Iguazu I

Session Chairs: Airong Chen, Xin Ruan and Dalei WANG

MINI-SYMPOSIA - MS15 - A Numerical Simulation Based Bridge Safety, Maintenance and Management

10:45 - 11:00

501 - STRENGTHENING AND RETROFIT OF THE RIVETED STEEL TRUSS GIRDER OF THE SONGPU BRIDGE

XIN RUAN

11:00 - 11:15

502 - STRENGTHENING AND RETROFIT OF A CENTENARY BRIDGE: ZHEJIANG ROAD BRIDGE

XIN RUAN

11:15 - 11:30

503 - RESEARCH ON MEASURING THE PRE-TIGHTENING FORCE IN SCREWS USING ULTRASONIC METHOD

ZHEN ZHANG

11:30 - 11:45

504 - RESEARCH ON NEW METHOD FOR MEASURING THE PRE-TIGHTENING FORCE IN SCREWS

ZHEN ZHANG

11:45 - 12:00

505 - LIMITED ANTI-COLLISION STANDARD BASED DESIGN OF EXISTING BRIDGES IN SHANGHAI INLAND WATERWAYS

ZHIYI YIN

11:00 - 12:00 - ORAL SESSION 47

Room: Cataratas II

Session Chairs: Rui Calçada and Gustavo Henrique Siqueira

GENERAL SESSION - Fatigue and Fracture Mechanics II

11:00 - 11:15

118 - BRIDGE KNOWLEDGE MANAGEMENT USING ONTOLOGIES

ROSEMARIE HELMERICH

11:15 - 11:30

137 - SEISMIC FRAGILITY AND LOSS CURVES TO REPAIR THE BRIDGE MOTIN DE ORO IN MEXICO

MARIA DE LA CONSOLACION GOMEZ

13:30 - 14:00 – KEYNOTE LECTURE

Room: Cataratas I

Session Chair: André Teófilo Beck

Design of Large Bridges for Ease of Inspection and Safety against Fire and Ship Impact

Naeem Hussain - ARUP, Hong Kong, China

Infrastructure plays a key and vital role in the economic development of a country or region and in several parts of the world this means constructing crossings across wide rivers, bays and estuaries, which have been a hindrance to the movement of people and goods and related economic development. Where crossings have been in the form of a bridge instead of a tunnel, the choice on type of bridge has been based on comparison of environmental, durability, maintenance, safety, construction period and cost considerations.

The method of construction has a significant influence on bridge durability which has led to the use of large off-site pre-fabricated elements being used for construction. Safety against fire and ship impact has been another major consideration influencing the span and configuration of the bridge. The key-note lecture will describe the author's personal experience in the design and construction of large sea-crossing bridges to achieve quality and durable construction, ease of inspection and maintenance and safety against fire and ship impact.

JUNE 28TH, 2016

14:00 - 14:45 - ORAL SESSION 19

Room: Iguazu I

Session Chairs: Romilde Almeida de Oliveira and Luiz Carlos de Almeida

GENERAL SESSION - Foundations

14:00 - 14:15

288 - BRIDGE INFORMATION MODELING – A SYSTEMATIC LITERATURE REVIEW

PATRÍCIA SCHIPITOSKI MONTEIRO

14:15 - 14:30

50 - IMPROVED STRUCTURAL DESIGN OF BRIDGES APPROACH CONCRETE SLABS

MOHAMED NASSER A. N. DARWISH

14:30 - 14:45

306 - LRFD PRELIMINARY DESIGN CHARTS FOR SIMPLE AND TWO-SPAN CONTINUOUS PRESTRESSED CONCRETE BRIDGES

JORGE MÁRQUEZ MÁRQUEZ BALDERRAMA

14:00 - 16:00 - ORAL SESSION 20

Room: Iguazu III

Session Chairs: Robby Caspeepe and Masahiro Sakano

GENERAL SESSION - Assessment and Evaluation II

14:00 - 14:15

323 - FINITE ELEMENT MODEL UPDATING FOR SHORT-SPAN BRIDGES USING VEHICLE LOAD INPUT-DEFLECTION OUTPUTS

KI YOUNG KOO

14:15 - 14:30

26 - FIRST PROPOSALS FOR THE APPLICATION OF STRUCTURAL REDUNDANCY IN TRADITIONAL CHILEAN BRIDGES

PABLO I. FIGUEROA

14:30 - 14:45

300 - FRAGILITY CURVES OF SINGLE COLUMN BRIDGES RETROFITTED WITH RC JACKETS

BERTHA A OLMOS

14:45 - 15:00

443 - INVESTIGATION OF LOADING RATE EFFECTS IN REINFORCED CONCRETE BRIDGE PIERS BY USING SLOW AND REAL-TIME HYBRID SIMULATIONS

YUNBYEONG CHAE

15:00 - 15:15

517 - LONG LASTING HIGH PERFORMANCE STEEL BRIDGE RESEARCH PROGRESS AND ENGINEERING APPLICATION

CHUN SHENG WANG

15:15 - 15:30

516 - MONITORING BASED RELIABILITY ASSESSMENT OF THE TRACK-BRIDGE INTERACTION FOR CONTINUOUS WELDED RAILS

ALFRED STRAUSS

15:30 - 15:45

604 - NUMERICAL PREDICTION OF PUNCHING BEHAVIOR OF RC SLABS USING 3D NONLINEAR FE ANALYSIS

JIANGPENG SHU

15:45 - 16:00

457 - DESIGN CHECKS AND NONLINEAR RESPONSE OF A FULL 3D MODEL OF A BOX GIRDER BRIDGE

MAZIAR PARTOVI

JUNE 28TH, 2016

14:00 - 15:00 - ORAL SESSION 21

Room: Cataratas II

Session Chairs: Joan Casas and Dan Frangopol

MINI-SYMPOSIA - MS14 - Research and Applications in Bridge Health Monitoring II

14:00 - 14:15

330 - STRUCTURAL HEALTH MONITORING SYSTEM DESIGN: A FRAMEWORK FROM OBJECTIVE DEFINITION TO EXPECTED DIAGNOSTICS.

JAIME ESTEBAN MAYORGA MARÍN

14:15 - 14:30

333 - DAMAGE LOCALIZATION THROUGH EMPIRICAL MODAL ANALYSIS ON FULL SCALE CABLE STAYED STRUCTURE

ALEJANDRO ANDRÉS TORRES

14:30 - 14:45

134 - ACCELERATED FINITE ELEMENT MODEL CALIBRATION BY SUBSTRUCTURE ANALYSIS WITH PARALLEL GENETIC ALGORITHM OPTIMIZATION

ZHENG YI WU

14:45 - 15:00

476 - DAMAGE IDENTIFICATION OF RAILWAY BRIDGES BASED ON GENETIC ALGORITHM

ANDREIA GOMES MEIXEDO

14:00 - 14:45 - ORAL SESSION 22

Room: Cataratas I

Session Chairs: Jürgen Krieger and Nigel Glenn Powers

SPECIAL SESSION - SS2 - Aging Road Infrastructure - Challenges for Owners and Operators

14:00 - 14:15

159 - AGING HIGHWAY BRIDGES - CHALLENGES FOR OWNERS AND OPERATORS

JUERGEN PETER KRIEGER

14:15 - 14:30

240 - GERMAN GUIDELINES FOR THE RE-ASSESSMENT OF EXISTING HIGHWAY BRIDGES

BALTHASAR NOVÁK

14:30 - 14:45

273 - RE-ASSESSMENT AND UPGRADING STRATEGIES FOR HIGHWAY BRIDGES - CASE STUDIES

VAZUL BOROS

JUNE 28TH, 2016

14:45 - 16:00 - ORAL SESSION 23

Room: Cataratas I

Session Chairs: André T. Beck, Sofia Maria Carrato Diniz and Fernando Stucchi

**MINI-SYMPOSIA - MS8 - Structural Reliability
Methods For Bridge Safety And Maintenance**

14:45 - 15:00

355 - A STOCHASTIC DYNAMICS

**APPROACH FOR EFFICIENT
INCREMENTAL DYNAMIC ANALYSIS**

KETSON ROBERTO MAXIMIANO DOS SANTOS

15:00 - 15:15

**567 - FATIGUE RELIABILITY
ASSESSMENT METHOD FOR
CONCRETE GIRDER BRIDGES**

CHUNSHENG WANG

15:15 - 15:30

**568 - SERVICE SAFETY ASSESSMENT OF
STRENGTHENED CONCRETE GIRDER BRIDGES
BASED ON MONITORING DATA**

CHUNSHENG WANG

15:30 - 15:45

**219 - PROBABILISTIC MODELLING AND
ASSESSMENT OF RAILWAY BRIDGES**

LORCAN CONNOR CONNOLLY

15:45 - 16:00

**284 - RELIABILITY ASSESSMENT OF
CIRCULAR REINFORCED CONCRETE
COLUMNS CONFINED BY FRP**

JUSCELINA ROSIANE FERREIRA

14:45 - 16:00 - ORAL SESSION 25

Room: Iguazu I

Session Chairs: Hani Nassif and Rebecca Jane Gravina

GENERAL SESSION - Health Monitoring

14:45 - 15:00

**211 - ESTIMATING MARKOV TRANSITION
PROBABILITIES FOR REINFORCED CONCRETE
BRIDGES BASED ON MECHANISTIC-EMPIRICAL
CORROSION MODELS**

NAM LETHANH

15:00 - 15:15

**263 - INFLUENCE OF REINFORCEMENT
CORROSION ON MOMENT AND SHEAR
RESISTANCE IN TIME OF RC BRIDGE GIRDER**

PETER KOTEŠ

15:15 - 15:30

**688 - EXPERIMENTAL STUDY ON MONITORING
THE SHEAR DEGRADATION OF REINFORCED
CONCRETE MEMBERS**

NORBERT RANDL

15:30 - 15:45

**602 - MULTI-SENSOR MONITORING APPLIED
TO A STRESS-RIBBON FOOTBRIDGE**

ANTÓNIO JOSÉ DE SOUSA BARRIAS

15:45 - 16:00

**265 - CORROSION DETERMINATION OF
REINFORCEMENT AND APPLICATION
FOR BRIDGE STRUCTURE**

PETER KOTEŠ

JUNE 28TH, 2016

15:00 - 16:00 - ORAL SESSION 24

Room: Cataratas II

Session Chairs: Airong Chen and Xin Ruan

MINI-SYMPOSIA - MS15 - A Numerical Simulation Based Bridge Safety, Maintenance And Management

15:00 - 15:15

655 - BAYESIAN UPDATING BASED RESISTANCE MODEL OF BRIDGE SUSPENDER

JUNYONG ZHOU

15:15 - 15:30

662 - NUMERICAL STUDY ON THE CHLORIDE ATTACK OF A CONCRETE CABLE-STAYED BRIDGE

ZHIYI YIN

15:30 - 15:45

336 - NUMERICAL EVALUATION OF TEMPERATURE EFFECT ON DIFFERENT BRIDGE CONFIGURATIONS

NICOLAS GUZMAN

15:45 - 16:00

660 - OPTIMIZE BRIDGE CONSTRUCTION PROCESS DESIGN BASED ON BIM TECHNOLOGY

XUEFEI SHI

16:30 - 18:30 - ORAL SESSION 26

Room: Iguazu I

Session Chair: Rosemarie Helmerich

GENERAL SESSION - Assessment and Evaluation III

16:30 - 16:45

80 - PARAMETRIC STUDY OF THE DUCTILITY CAPACITY IN COMMON HIGHWAY BRIDGES

MARÍA CONSOLACIÓN GÓMEZ- SOBERÓN

16:45 - 17:00

477 - REMAINING SERVICE LIFE ASSESSMENT OF RIVER BRIDGES WITH CRACKED MEMBERS

SEDA ÖZDEMİR

17:00 - 17:15

375 - RESEARCH ON IMPROVED FUZZY TOPSIS METHOD WITH AN APPLICATION TO BRIDGE STATE ASSESSEMENT

QIANHUI YU

17:15 - 17:30

530 - RETROFIT DESIGN OF A BRAZILIAN BRIDGE SUBJECTED TO STORM SURGE AND COASTAL WAVES

GUILHERME TRAJANO ALVES LEITE

17:30 - 17:45

581 - SEISMIC PERFORMANCE OF REINFORCED CORRODED CONCRETE BRIDGE PIERS

CONGQI FANG

17:45 - 18:00

235 - THE INFLUENCE OF MECHANICAL PROPERTIES VARIATION OF NATURAL RUBBER SEISMIC ISOLATORS ON THE FRAGILITY RESULTS FOR MULTI-SPAN CONCRETE BRIDGES

GUSTAVO HENRIQUE SIQUEIRA

18:00 - 18:15

399 - UNCERTAINTIES IN EXISTING SAFETY FORMATS FOR SLENDER CONCRETE COLUMNS

ALFRED STRAUSS

18:15 - 18:30

620 - RELIABILITY ASSESSMENT OF CONCRETE COLUMNS

JAN PODROUŽEK

JUNE 28TH, 2016

16:30 - 18:30 - ORAL SESSION 27

Room: Iguazu III

Session Chairs: Alfred Strauss and Enson Portela

GENERAL SESSION

Life-Cycle Assessment

16:30 - 16:45

388 - BRIDGES: RECENT RESEARCH ASPECTS AND DEVELOPMENTS

LUIS SIMOES DA SILVA

16:45 - 17:00

114 - SIMULATION OF LOW CYCLE FATIGUE PERFORMANCE OF STEEL H PILES VIA FINITE ELEMENT APPROACH

MEMDUH KARALAR

17:00 - 17:15

112 - DEVELOPMENT OF A NEW CYCLE COUNTING METHOD FOR CYCLIC THERMAL STRAINS IN INTEGRAL BRIDGE PILES

MURAT DICLELI

17:15 - 17:30

277 - FATIGUE ANALYSIS OF REINFORCED CONCRETE BRIDGES FROM MONITORING DATA

PAULO JUNGES

17:30 - 17:45

68 - FATIGUE EVALUATION OF RIB-TO-DECK WELDED JOINTS OF ORTHOTROPIC STEEL BRIDGE DECK BASED ON LEFM

XING WEI

17:45 - 18:00

255 - FATIGUE PROPERTY ANALYSIS OF STEEL BOX GIRDER BASED ON MONITORING DATA

YUE PAN

18:00 - 18:15

312 - HIGH-CYCLE FATIGUE OF REINFORCED CONCRETE BRIDGES BASED ON MONITORING DATA

LEILA CRISTINA CRISTINA MENEGHETTI

16:30 - 18:30 - ORAL SESSION 28

Room: Cataratas I

Session Chairs: Airong Chen, Nurdan Apaydin and Xin Ruan

MINI-SYMPOSIA - MS16 - A Management of Major Bridges for Resilience, Safety and Maintenance

16:30 - 16:45

658 - BLOCK TRAVEL OF HEAVY DUTY TRUCKS OVER A SUSPENSION BRIDGE: A CASE STUDY

NURDAN MEMISOGLU APAYDIN

16:45 - 17:00

598 - BRIDGE SCOUR RISK IN A CHANGING CLIMATE: A SENSITIVITY ANALYSIS

HRISTO EMILOV DIKANSKI

17:00 - 17:15

654 - THE APPLICATION OF HEALTH MONITORING SYSTEM FOR THE MAINTENANCE OF CHINESE BRIDGES

AIRONG CHEN

17:15 - 17:30

640 - USING INNOVATIVE MAINTENANCE TO EXTEND LIFETIME OF RAILWAY BRIDGES AND TUNNELS

JANNE WUORENJUURI

17:30 - 17:45

657 - STRUCTURAL HEALTH MONITORING SYSTEMS-SHMS OF THE LONG SPAN BRIDGES IN TURKEY

NURDAN MEMISOGLU APAYDIN

17:45 - 18:00

627 - AN ELEGANT HYBRID SOLUTION TO CROSS THE BOSPHORUS STRAIT IN A MIXED-TRAFFIC ENVIRONMENT WITHIN AN EVER-EXPANDING URBAN CONTEXT

ROBERTO SORGE

JUNE 28TH, 2016

16:30 - 18:30 - ORAL SESSION 29

Room: Cataratas II

Session Chairs: José António Silva de Carvalho Campos e Matos and Joan Casas

SPECIAL SESSION - SS5 - European Standardization of Quality Specifications for Roadway Bridges

16:30 - 16:45

25 - COST ACTION TU 1406 QUALITY SPECIFICATIONS FOR ROADWAY BRIDGES (BRIDGESPEC)

JOSE CAMPOS MATOS

16:45 - 17:00

72 - EUROPEAN STANDARDIZATION OF QUALITY SPECIFICATIONS FOR ROADWAY BRIDGES: AN OVERVIEW

JOAN R CASAS

17:00 - 17:15

398 - PERFORMANCE INDICATORS FOR QUALITY SPECIFICATIONS OF ROADWAY BRIDGES ACROSS EUROPE

ALFRED STRAUSS

17:15 - 17:30

207 - PERFORMANCE GOALS FOR ROADWAY BRIDGES

GIEL KLANKER

17:30 - 17:45

127 - QUALITY CONTROL PLANS FOR ROADWAY BRIDGES, WG3

RADE HAJDIN

17:45 - 18:00

400 - QUALITY CONTROL OF ROAD BRIDGES IN POLAND

JAN BIEN

18:30 - 20:30 – GENERAL ASSEMBLY

Room: Cataratas I

JUNE 29TH - WEDNESDAY

8:30 - 9:00 – KEYNOTE LECTURE

Room: Cataratas I

Session Chair: André Teófilo Beck

Masonry arch bridges in the Italian railway engineering experience: state of condition, static reliability, seismic verification and retrofit strategies

Carmelo Maiorana - University of Padua, Padua, Italy

Masonry arch bridges still represent a crucial element of the railway transportation network across Europe. Many of them are part of the historical heritage of the XIX century, and are under-designed for actual service conditions. Due to the intrinsic weakness of some structural components, to deterioration phenomena and to the updating of structural codes, masonry arched structures show often inadequate performance considering the static and seismic requirements of current codes. Reliable methods are thus required for the assessment of static and seismic reliability, and to prioritize retrofit interventions.

Simplified procedures shall be used for large-scale planning: for this purpose the kinematic method, based on an adaptation of limit design for masonry structures, has proved to be a conceptually simple and robust procedure to verify the safety of masonry arches. If more detailed analyses are needed on single structures, non-linear analyses using F.E. models can be adopted for a more comprehensive characterization of the behaviour under static and seismic forces. Standard strategies should be finally proposed for the rehabilitation of arch bridges, taking into account to this end the original design and construction system and limiting to the minimum the required retrofit interventions.

9:00 - 9:30 – KEYNOTE LECTURE

Room: Cataratas I

Session Chair: Tulio Nogueira Bittencourt

Superlong Span Bridges

Man-Chung Tang - T. Y. Lin International, San Francisco, CA, USA

Bridges can be categorized by span lengths, such as short span, medium span, long span and super-long span. Bridges can also be categorized by type, such as girder bridges, arch bridges, cable-stayed bridges and suspension bridges. It will be interesting to study how long a span each of these four types of bridges can be.

JUNE 29TH, 2016

10:00 - 11:30 - ORAL SESSION 30

Room: Iguazu I

Session Chairs: Jens Sandager Jensen and Roberto Torrent

**GENERAL SESSION - Maintenance Strategies,
Repair and Replacement**

10:00 - 10:15

**438 - STRUCTURAL REHABILITATION
OF THE KAMORO SUSPENSION
BRIDGE IN MADAGASCAR**

ALESSANDRA MARCHIONDELLI

10:15 - 10:30

641 - HERCÍLIO LUZ BRIDGE REHABILITATION

HERMES CARVALHO

10:30 - 10:45

**599 - REPLACEMENT BRIDGE PIERS FOR SEISMIC
RETROFIT UNDER TRAFFIC SERVICE**

TATSUO OGATA

10:45 - 11:00

**689 - O&M STRATEGY FOR
THE CHACAO BRIDGE**

JAKOB LAIGAARD JENSEN

11:00 - 11:15

**642 - APPLICATION OF FRP MATERIALS FOR A
RENOVATION OF STEEL RAILWAY BRIDGES**

PAVEL RYJACEK

10:00 - 12:00 - ORAL SESSION 31

Room: Iguazu III

Session Chairs: Michèle Schubert Pfeil
and Bruno Briseghella

**GENERAL SESSION
Bridge Testing and Validation**

10:00 - 10:15

**39 - ANALYSIS OF SUITABILITY OF NEW
MEASUREMENT TECHNOLOGIES TO EXAMINE
CHANGES IN GEOMETRIC PARAMETERS OF A
SUSPENSION BRIDGE**

WOJCIECH ANIGACZ

10:15 - 10:30

**229 - FIELD VIBRATION TEST ON EVALUATION OF
NATURAL VIBRATION CHARACTERISTICS OF AN
EXISTING CABLE-STAYED BRIDGE**

MASATO KOMURO

10:30 - 10:45

**665 - IMPROVEMENT OPPORTUNITY TO BRIDGE
INSPECTIONS IN BRAZIL**

DENISE MARTINS CHAGAS

10:45 - 11:00

**136 - STRUCTURAL PERFORMANCE AND FAILURE
LOADING OF A 55 YEAR-OLD PRESTRESSED
CONCRETE GIRDER BRIDGE**

NIKLAS BAGGE

11:00 - 11:15

**225 - TRIAL CONSTRUCTION REPORT OF NEW
SLAB LINK METHOD IN HANSHIN-EXPRESSWAY**

HAJIME HIDA

11:15 - 11:30

**56 - VALIDATION OF FIELD EXTERIOR GIRDER
ROTATION IN NON-SKEWED BRIDGE DUE TO
CONSTRUCTION LOAD WITH FE ANALYSIS**

MD ASHIQUZZAMAN

JUNE 29TH, 2016

10:00 - 12:00 - ORAL SESSION 32

Room: Cataratas I

Session Chair: Romilde Almeida de Oliveira

MINI-SYMPOSIA - MS17 - Bridge Foundations - Structural And Geotechnical Aspects

10:00 - 10:15

668 - ANALYSIS OF PILE CAP BEHAVIOR IN CONNECTION WITH STEEL PILES

RONALDO BURGOS FILHO

10:15 - 10:30

680 - NUMERICAL STAGED-CONSTRUCTION ANALYSIS OF PRECAST CONCRETE BRIDGE

ROMILDE ALMEIDA DE OLIVEIRA

10:30 - 10:45

238 - STRUCTURAL ANALYSIS OF PILE CAPS, USED IN BRIDGE FOUNDATION, SUBJECT TO AAR

CHRISTIANE MENEZES GAMELEIRA

10:45 - 11:00

247 - STUDY ON THE STRESS DISTRIBUTION IN THE FOUNDATION OF BLOCKS ON FOUR PILES, USED IN BRIDGES

VALMIRO GAMELEIRA NUNES

11:00 - 11:15

311 - A PROBABILISTIC EVALUATION OF AN INTEGRAL ABUTMENT BRIDGE

MIGUEL MUNOZ MACHICAO

10:00 - 11:15 - ORAL SESSION 33

Room: Cataratas II

Session Chairs: Rui Calçada,
and Túlio Nogueira Bittencourt

SPECIAL SESSION - SS6 - Bridges for High-Speed Railways

10:00 - 10:15

195 - EVALUATION OF THE DYNAMIC EFFECT AT THE CANTILEVER BRACKETS OF A MULTI-SPAN STEEL BOX GIRDER RAILWAY BRIDGE

LADISLAO ROGER TICONA MELO

10:15 - 10:30

600 - FIELD MEASUREMENTS OF MAGLEV TRAIN-INDUCED VIBRATIONS

ZHILU WANG

10:30 - 10:45

343 - PROBABILISTIC METHODOLOGY FOR AN EFFICIENT SAFETY ASSESSMENT OF HIGH-SPEED RAILWAY BRIDGES

ANTÓNIO ABEL HENRIQUES

10:45 - 11:00

107 - LARGE BRIDGE "IN PÉRGOLA" FOR HIGH SPEED TRAINS TO THE NORTHWEST OF SPAIN

CARLOS JURADO

11:00 - 11:15

406 - INFLUENCE OF TRACK IRREGULARITIES IN THE GLOBAL AND LOCAL DYNAMIC RESPONSE OF PRECAST DECKS UNDER RAILWAY TRAFFIC LOADS

RUI CALÇADA

JUNE 29TH, 2016

11:15 - 12:15 - ORAL SESSION 34

Room: Cataratas II
Session Chairs: Hani Nassif
and Túlio Bittencourt

**SPECIAL SESSION - SS9 - A Development
and Application of Weigh-In-Motion (Wim)
Technology for Bridge Structures**

11:15 - 11:30

**632 - LIVE LOAD PREDICTIONS BASED
ON DAILY MAXIMUM VEHICLE WEIGHT
FROM WEIGH-IN-MOTION (WIM) DATA**

HANI H NASSIF

11:30 - 11:45

**636 - CALIBRATION OF WEIGH-IN-MOTION SYSTEM
CONSIDERING TEMPERATURE EFFECTS**

EUI-SEUNG HWANG

11:45 - 12:00

**416 - LIVE LOADS IN CONDITION
ASSESSMENT OF OLD BRIDGES**

JAN BIEN

11:30 - 12:00 - ORAL SESSION 35

Room: Iguazu I
Session Chairs: Upul Attanayake and Haluk Aktan

**SPECIAL SESSION - SS12 - Accelerated
Bridge Construction (Abc) - Innovations and
Implementations**

11:30 - 11:45

**389 - PREFABRICATED VS CAST-IN-SITU CONCRETE
BRIDGES IN A WHOLE LIFE PERSPECTIVE**

POUL LINNEBERG

11:30 - 11:45

**389 - PREFABRICATED VS CAST-IN-SITU CONCRETE
BRIDGES IN A WHOLE LIFE PERSPECTIVE**

POUL LINNEBERG

11:45 - 12:00

**52 - SUBSTRUCTURE SOLUTIONS FOR
ACCELERATED BRIDGE CONSTRUCTION**

ARJUNA PRIYARA RANASINGHE

13:30 - 14:00 – KEYNOTE LECTURE

Room: Cataratas I
Session Chair: André Teófilo Beck

SHM-Based Fatigue Damage Prognosis for Long-Span Cable-Supported Bridges under Multiple Dynamic Loadings
You-Lin Xu - The Hong Kong Polytechnic University, Hong Kong, China

Many innovative long-span cable-supported steel bridges have been built around the world. When these bridges are constructed in wind-prone regions, they suffer considerable buffeting-induced vibration. The frequent occurrence of such a buffeting response at relatively large amplitude may cause fatigue damage to steel members and their connections. Long-span bridges also carry highway and/or railway loadings, and these dynamic loadings affect the fatigue life of the bridge as well. The fatigue damage prognosis (FDP) of bridges under multiple fatigue loadings is therefore necessary for bridge maintenance, safety and management. However, it is a challenging task due to the complexity of structural systems, randomness in fatigue loadings and complicated mechanisms of fatigue damage.

Long-term structural health monitoring (SHM) systems have been developed in recent years to measure the dynamic loadings and structural responses of long-span bridges, and to assess their functionality and safety while tracking the symptoms of operational incidents and potential damage. SHM technology thus provides a promising means of tackling challenging FDP issues. However, current research has tended to separate the SHM and FDP of long-span bridges, even though their integration has been advocated in other fields to achieve a reliable and robust FDP.

This paper will present an SHM-based FDP framework for long-span bridges under combined traffic and wind loadings based on the work done by the author and his co-workers over the past 20 years. It involves five major tasks: (1) integrate multi-scale finite element modelling and model updating with stress analysis for predicting both the global and local structural responses of long-span bridges under combined traffic and wind loadings; (2) develop loading models based on incessant field measurement data from the SHM system so that the previous loading histories can be analysed and future loadings can be forecast; (3) determine the optimal placement of multi-type sensors for the best global and local response reconstruction of the bridge; (4) propose an FDP model for the bridge based on continuum damage mechanics and measurement data; and (5) examine the feasibility of the proposed SHM-based FDP method through case studies. It is anticipated that the proposed approach will be one of the most comprehensive and reliable FDP methods for long-span bridges.

JUNE 29TH, 2016

14:00 - 16:00 - ORAL SESSION 36

Room: Iguazu I

Session Chairs: Leila Cristina Meneghetti
and Leandro Mouta Trautwein

GENERAL SESSION

New Design Methods

14:00 - 14:15

**451 - A COLLAPSE INDUCED BY
THE SHORTENING IN A
MULTISPAN VIADUCT**

PIER GIORGIO MALERBA

14:15 - 14:30

**138 - CAR MEASURING ROAD SURFACE
PROPERTIES AND VIEWER APPARATUS
INTEGRATING DATA MEASURED**

TETSUYA UNOTSU

14:30 - 14:45

**291 - COMPARISON OF DIFFERENT TECHNIQUES
FOR MEASURING THE CABLE TENSION OF CABLE-
STAYED BRIDGE DURING THE TENSIONING
PROCESS**

MIGUEL ANGEL VICENTE

14:45 - 15:00

**294 - COMPARISON OF DIFFERENT TECHNIQUES
FOR MEASURING THE VERTICAL DEFLECTION IN
CONCRETE BOX-GIRDER VIADUCTS WITH LARGE
SPANS AND LARGE HEIGHT**

MIGUEL ANGEL VICENTE

15:00 - 15:15

**154 - A CASE STUDY IN THE APPLICATION OF
LIVE LOAD TESTING AND STRUCTURAL HEALTH
MONITORING**

JESSE GRIMSON

15:15 - 15:30

**251 - FINITE ELEMENT MODEL UPDATING METHOD
CONSIDERING BRIDGE SUPPORT CONDITION**

JONG-JAE LEE

15:30 - 15:45

**425 - DYNAMIC MONITORING OF A BRIDGE'S
SCALE MODEL IN ORDER TO CALIBRATE A
NUMERICAL STRUCTURAL MODE**

RODRIGO LOPES SILVA

14:00 - 16:00 - ORAL SESSION 48

Room: Iguazu II

Session Chairs: Hani Nassif and Túlio Bittencourt

**GENERAL SESSION - Â Development
and Application of Weigh-In-Motion (Wim)
Technology for Bridge Structures**

14:00 - 14:15

**633 - CHARACTERIZATION OF TRUCK TRAFFIC
IN NEW JERSEY BASED ON 20-YEARS
OF WEIGH-IN-MOTION (WIM) DATA**

DAN SU

14:15 - 14:30

**352 - MIXED-MODE FATIGUE CRACK PROPAGATION
RATES OF CURRENTS STRUCTURAL STEELS
APPLIED FOR BRIDGES AND TOWERS
CONSTRUCTION**

RUI A.B. CALÇADA

14:30 - 14:45

**307 - OPTIMISATION OF INSPECTION AND
MAINTENANCE ACTIVITIES FOR BRIDGE
COMPONENTS**

MOHAMED FAROOK KALENDHER LEBBE

14:45 - 15:00

**187 - EXPERIMENTAL DAMAGE
IDENTIFICATION IN A POST TENSIONED
CONCRETE BEAM**

MARIA PINA LIMONGELLI

15:00 - 15:15

**188 - NUMERICAL INVESTIGATION ON DAMAGE
SEVERITY ESTIMATION BASING ON**

MARIA PINA LIMONGELLI

15:15 - 15:30

**28 - VIADUCT CONSTRUCTION WITH MOVABLE
SCAFFOLDING SYSTEM: NEW SEQUENCE**

JOSÉ RAMÓN DÍAZ DE TERÁN LÓPEZ

15:30 - 15:45

**29 - CONSTRUCTION OF VIADUCTS WITH MOVABLE
SCAFFOLDING SYSTEM: COMPARATIVE BETWEEN
THE TRADITIONAL SEQUENCE AND NEW SEQUENCE**

JOSÉ RAMÓN DÍAZ DE TERÁN LÓPEZ

15:45 - 16:00

**613 - AVERAGE BRIDGE CONSUMPTION COSTS
FOR ROUTE SEGMENTS**

JOSE WEISSMANN

JUNE 29TH, 2016

14:00 - 14:45 - ORAL SESSION 37

Room: Iguazu III

Session Chairs: José Luiz Antunes de Oliveira e Sousa and Juliana Ferreira Fernandes

GENERAL SESSION

Non-destructive Testing

14:00 - 14:15

453 - ANALYSIS OF CABLES IN CABLE-STAYED BRIDGES

IVIANE CUNHA SANTOS

14:15 - 14:30

205 - TRAFFIC LOAD EFFECTS ON DYNAMIC BRIDGE PERFORMANCE

ILZE PAEGLITE

14:30 - 14:45

179 - VIBRATION RESPONSE CHARACTERISTICS OF SOUND BARRIER UNDER VEHICLE-INDUCED AERODYNAMIC LOAD AND ANTI- FATIGUE DESIGN SUGGESTION

DALEI WANG

14:00 - 16:00 - ORAL SESSION 38

Room: Cataratas I - Session Chair: Paul D. Thompson

MINI-SYMPOSIUM - MS18 - Advanced and Innovative Approaches to Bridge Management Including Risk Management / Risk Based Decision Making, Measuring and Reporting Performance, and New Bridge Management Approaches From Around The World

14:00 - 14:15

102 - PRACTICAL PERFORMANCE MEASURES FOR BRIDGE MANAGEMENT

REED MAXWELL ELLIS

14:15 - 14:30

331 - AN APPLICATION OF EXPECTED UTILITY THEORY FOR THE OPTIMIZATION OF BRIDGE MAINTENANCE STRATEGIES

CARLO CAPPELLO

14:30 - 14:45

144 - ISSUE APPROACH FOR MEDIUM TERM RENOVATION AND REPLACEMENT PLANNING

GIEL KLANKER

14:45 - 15:00

182 - MANAGEMENT OF BRIDGES WITH SHALLOW FOUNDATIONS EXPOSED TO LOCAL SCOUR

NIKOLA TANASIC

15:00 - 15:15

148 - A METHODOLOGY TO DETERMINE THE MOST SUSTAINABLE BRIDGE WORK PROGRAMS THROUGH IMPROVED STRUCTURE LEVEL CONSIDERATIONS

ZANYAR MIRZAEI

15:15 - 15:30

103 - TRACKING BRIDGE CONDITIONS VERSUS BUDGETS USING BRIDGE MANAGEMENT SYSTEM TOOLS IN PRINCE EDWARD ISLAND DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE

DARRELL EVANS

15:30 - 15:45

88 - NETWORK LEVEL RISK ANALYSIS IN BRIDGE MANAGEMENT

PAUL D THOMPSON

15:45 - 16:00

89 - BRIDGE PERFORMANCE ANALYSIS IN TRANSPORTATION ASSET MANAGEMENT PLANS

PAUL D THOMPSON

JUNE 29TH, 2016

14:00 - 16:00 - ORAL SESSION 39

Room: Cataratas II

Session Chairs: Neil Gregory Lawless
and Eugene J. Obrien

GENERAL SESSION - Assessment and Evaluation IV

14:00 - 14:15

**217 - VEHICLE LOADING AND EFFECTS ON
ORTHOTROPIC STEEL DECK OF RUNYANG
BRIDGE BASED ON WIM DATA**

ZHEN ZHANG

14:15 - 14:30

**125 - NONLINEAR STRUCTURAL ANALYSIS
OF FLOATING BRIDGES**

ANDREA TITI

14:30 - 14:45

**440 - STRUCTURAL COLLAPSE ANALYSIS
OF A BAILEY BRIDGE**

FABIO BIONDINI

14:45 - 15:00

**292 - IMPLEMENTATION OF LOAD RATING
PROVISIONS FOR HIGHWAY AND
RAILROAD ARCH BRIDGES**

ARJUNA PRIYARA RANASINGHE

15:00 - 15:15

**417 - REDUCED PARTIAL FACTORS FOR
ASSESSMENT IN UK ASSESSMENT STANDARDS**

CHRIS HENDY

15:15 - 15:30

**580 - AN EXAMINATION OF THE SEISMIC
PERFORMANCE OF ROCKER PIER BRIDGES
IN JAPANS OLDEST EXPRESSWAY**

SHOUYI LI

14:45 - 16:00 - ORAL SESSION 40

Room: Iguazu III

Session Chairs: Arthur Medeiros and Jerome P. Lynch

**GENERAL SESSION - MS7 - Smart Bridge
Structural Health Monitoring**

14:45 - 15:00

**186 - PRACTICAL STRUCTURAL MONITORING AND
DIAGNOSTIC TESTING OF STEEL DECK TRUSS
BRIDGE**

REED MAXWELL ELLIS

15:00 - 15:15

**420 - IMPROVED STRUCTURAL HEALTH
MONITORING OF BRIDGES USING DIGITAL IMAGE
CORRELATION**

JAN WINKLER

15:15 - 15:30

**332 - MULTI-SENSOR STRUCTURAL MONITORING
OF COLLE ISARCO VIADUCT**

CARLO CAPPELLO

15:30 - 15:45

**644 - ON-SITE NON-DESTRUCTIVE EVALUATION
SYSTEM FOR PC STRUCTURES USING X-RAY AND
NEUTRON SOURCES**

YOSHINOBU OSHIMA

15:45 - 16:00

**261 - STRUCTURAL HEALTH MONITORING
- A SMART TIMBER BRIDGE**

TRAVIS HOSTENG

16:30 - 17:45 - ORAL SESSION 41

Room: Iguazu I

Session Chairs: Mário Pimentel
and Leandro Mouta Trautwein

GENERAL SESSION

Optimum Design / Optimization

16:30 - 16:45

**525 - CABLE-STAY BRIDGES – INVESTIGATION
OF CABLE RUPTURE AND BRIM CONTRIBUTION**

NGUYEN TRONG NGHIA

16:45 - 17:00

**628 - DETERIORATIONS OF CONCRETE
STRUCTURES IN GUNKAN ISLAND**

KEI-ICHI IMAMOTO

17:00 - 17:15

**643 - HISTORICAL STUDY OF THE DESIGN
SOLUTION FOR BRIDGES IN THE STATE OF PARANA**

INGRID GIACOMELI

16:30 - 18:30 - ORAL SESSION 42

Room: Iguazu III

Session Chairs: Carlos Eduardo Rossigali
and Alfredo Pinto da Conceicao Neto

**GENERAL SESSION - Visual Inspections
and Diagnostics**

16:30 - 16:45

**532 - EXPERIMENTAL STUDY OF POST-INSTALLED
CORBELS WITH ADHESIVE ANCHORS**

JOAO HENRIQUE LANNES DAMASCENO

16:45 - 17:00

**122 - EXTENDING THE LIFETIME OF STRUCTURES
– PREVENTION OF AND PROTECTION AGAINST
CORROSION**

RENE BRUECKNER

17:00 - 17:15

**40 - FEM ANALYSIS AND MODERNIZATION OF
HISTORIC ARCH RAILWAY VIADUCT**

DAMIAN BEBEN

17:15 - 17:30

**588 - INITIAL INSPECTIONS AND MONITORING
PLAN OF RIO-NITERÓI BRIDGE**

PAOLO FRANCHETTI

17:30 - 17:45

**106 - LIFTING UP A 270 METERS LENGTH SINKING
BRIDGE OVER GUADALQUIVIR RIVER WITH THE
TECHNIQUE OF JET-GROUTING**

CARLOS JURADO

17:45 - 18:00

**384 - RENOVATION OF CORRODED STEEL
MEMBER WITH RESIN AND REBARS**

HIROSHI OGAMI

18:00 - 18:15

**176 - STRENGTHENING SOLUTIONS
FOR REINFORCED CONCRETE BRIDGES
SUPERSTRUCTURES BUILT ON CONTINUOUS
BEAMS**

CORINA CHIOTAN

18:15 - 18:30

**43 - FINITE ELEMENT ANALYSIS
OF SOIL-STEEL ARCH BRIDGE**

DAMIAN BEBEN

JUNE 29TH, 2016

16:30 - 18:30 - ORAL SESSION 43

Room: Cataratas I

Session Chairs: Xin Ruan and Eugene Obrien

MINI-SYMPOSIA - MS2 - Bridge Loading - Measurement and Modelling

16:30 - 16:45

368 - A CREATION METHOD OF LANE LOAD ON HIGHWAY BRIDGES BASED ON DECK MONITORING VIDEO INTEGRATED WITH WIM DATA

YUE PAN

16:45 - 17:00

218 - CONSIDERING TRAFFIC GROWTH IN CHARACTERISTIC BRIDGE LOAD EFFECT CALCULATIONS

CATHAL LEAHY

17:00 - 17:15

356 - EFFECT OF VEHICLE BRIDGE INTERACTION ON BRIDGE SEISMIC RESPONSE

SABARETHINAM KAMESHWAR

17:15 - 17:30

499 - INFLUENCE OF SIMPLIFIED TRAFFIC SIMULATION ON THE ASSESSMENT OF LONG SPAN BRIDGE

JUNYONG ZHOU

17:30 - 17:45

282 - RECENT ADVANCEMENTS IN ACCURACY AND ROBUSTNESS OF BRIDGE WIM SYSTEMS

ALES ZNIDARIC

17:45 - 18:00

37 - SIMPLIFIED METHODOLOGY FOR DYNAMIC ANALYSIS OF CURVED ROAD BRIDGES WITH VEHICLE-STRUCTURE INTERACTION

ERIKA PINA SCHMIDT

16:30 - 18:30 - ORAL SESSION 44

Room: Cataratas II

Session Chair: Alfred Strauss

MINI-SYMPOSIA - MS6 - Novel Techniques Regarding the Assessment and Monitoring of Bridges

16:30 - 16:45

223 - CALCULATION OF OPTIMISED BRIDGE DYNAMIC AMPLIFICATION FACTOR USING BRIDGE WEIGH-IN-MOTION DATA

JAN KALIN

16:45 - 17:00

163 - OPTIMIZATION OF STRUCTURAL HEALTH MONITORING AND MAINTENANCE PLANNING BASED ON BAYESIAN JOINT MODELING OF TIME-DEPENDENT MEASUREMENTS AND HAZARD FUNCTIONS

CHENG XING

17:00 - 17:15

677 - SATELLITE INSAR APPLICABILITY FOR MONITORING BRIDGE DEFORMATIONS

MILAN LAZECKY

17:15 - 17:30

395 - TEMPERATURE STUDY OF RAIL - BRIDGE INTERACTION BASED ON MEASUREMENT AND NONLINEAR ANALYSIS

ALFRED STRAUSS

17:30 - 17:45

209 - VALIDATION OF VIBRATION MONITORING VIA SPECTRO-TEMPORAL COMPRESSIVE SENSING FOR WIRELESS SENSOR NETWORKS USING Z24 APPLICATION EXAMPLE

ROMAN PAWEL KLIS

17:45 - 18:00

397 - STRUCTURAL BEHAVIOR OF THE DAMAGED ARCH BRIDGES

ALFRED STRAUSS

18:00 - 18:15

605 - RECOMMENDATIONS CONCERNING THE INSPECTION AND MAINTENANCE OF BRIDGES AND VIADUCTS

PAULO HELENE

18:15 - 18:30

18 - REINFORCED CONCRETE BRIDGE DETERIORATION: A COMPREHENSIVE OVERVIEW CONSIDERING SEISMIC VULNERABILITY

ALESSIO PIPINATO

JUNE 29TH, 2016

17:30 - 18:30 - ORAL SESSION 45

Room: Iguazu I

Session Chairs: Juergen Peter Krieger and Kefei Li

**GENERAL SESSION - Prediction
of Future Traffic Demands**

17:30 - 17:45

**17 - STEEL BRIDGE CORROSION PROTECTION:
CODES, ANALYSIS AND APPLICATIONS**

ALESSIO PIPINATO

17:45 - 18:00

**48 - CHESAPEAKE BAY BRIDGE DEHUMIDIFICATION
DESIGN**

MARWAN NADI NADER

18:00 - 18:15

**432 - OPTIMUM SERVICE LIFE DETERMINATION
BASED ON COST-BENEFIT ANALYSIS**

SUNYONG KIM

18:15 - 18:30

**522 - PROPOSAL MAINTENANCE PLAN ON CABLE
SUPPORTED BRIDGES. CHILEAN EXPERIENCE AND
FUTURE CHALLENGES**

MARCELO MARQUEZ

18:30 - 19:00 – CLOSING CEREMONY

Room: Cataratas I

ORGANIZING ASSOCIATION



ORGANIZING INSTITUTIONS



FINANCIAL SUPPORT



BRONZE SPONSORSHIP



INSTITUTIONAL SUPPORT

