ASME PVP 2018 CONFERENCE

XP-resilience

EXTREME LOADING ANALYSIS OF PETROCHEMICAL PLANTS AND DESIGN OF METAMATERIAL-BASED SHIELDS FOR ENHANCED RESILIENCE

http://r.unitn.it/en/dicam/xp-resilience

MARIE CURIE ACTIONS

1st International Workshop on
Risk and Resilience of Industrial installations against natural threats and mitigation strategies

Prague, Czech Republic, 19-20 July, 2018

BACKGROUND

The tremendous impact of natural hazards, such as earthquakes, tsunamis, flooding, etc, which triggered technological accidents, referred to as natural-technological (NaTech) events, was demonstrated, for instance by the recent Tohoku earthquake and the following Fukushima disaster in 2011 or by the UK's 2015 winter floods which topped £5bn, with thousands of families and businesses that faced financial problems because of inadequate or non-existent insurance. The NaTech problem is quite relevant as up to 10% of industrial accidents, involving the release of Chemical, Biological, Radiological, Nuclear and high yield Explosives (CBRNE) substances, were triggered by natural hazards. To implement and support the Seveso II Directive 2012/18/EU which regulates the control of major accident hazards involving dangerous substances, XP-RESILIENCE intends to establish a network of individual research projects working towards Advanced Modelling and Protection –via metamaterial-based isolators/layouts- of Complex Engineering Systems for Disaster Reduction and Resilient Communities. In this respect, this workshop has the aim to offer to students and scholars a clear overview of the problems and the available solutions and tool. With important experts on Resilience and Na-tech risk the workshop will be a unique occasion to familiarize with this hot topic and be in contact with the resilience and risk calculation community.

INTERNATIONAL SCIENTIFIC COMMITTEE:
F. Paolacci, A.C. Caputo, S. Alessandri, O.S. Bursi, N. Tondini, M. Dolsek, S. Bousias, L. Di Sarno, A. Klimpel, M. Hjiaj, H. Wenzel, E. Padgett, G. Cimellaro, M. Pozzi, E. Patelli, B. Stojadinovic, S. Marelli

OBJECTIVES OF THE WORKSHOP
The main objective of this workshop is to familiarize Early Stage and Experienced Researchers with the state-of-the-art of risk and resilience of industrial installations. At the end of the course, attendants should acquire the basic knowledge concerning:

- Basic and advanced concepts for risk and resilience calculation
- Vulnerability analysis of the most critical industrial facility units
- Risk analysis methods of major-hazard industrial installations
- Resilience concepts applied to industrial facilities
- Concepts application through case studies

WORSHOP SCHEDULE July 19-20, 2018

1st DAY - Thursday 19 July

08:45-9.00	**Workshop Opening** • Pierre Martiny –Program Conference Chair of ASME PVP 2018 Conf. • Hakim Bouzid - Technical Program Chair pf ASME PVP 2018 Conf. • Oreste S. Bursi – Coordinator of XP-Resilience Project • Fabrizio Paolacci – Workshop Organizer
09:00-11:00	**G. Cimellaro (Polytechnic of Turin, Italy)** **Keynote Lecture: Key Issues in Resilience calculation of critical infrastructures**
11:00-11:15	**Coffee Break**
11:15-13:00	**A.C. Caputo (Roma Tre University, Italy)** **Problems and perspectives in seismic risk and resilience of chemical process plants for decision making**
13:00-14:00	**Lunch**
14:00-15:45	**F. Paolacci (Roma Tre University, Italy)** **A probabilistic methodology for the risk assessment of process plants including domino effects.**
15:45-16:00	**Coffee Break**
16:00-17.45	**O.S. Bursi (University of Trento, Italy)** **Metamaterial-based shield for resilience enhancement of petrochemical plant**

2nd DAY – Friday 20 July

09:00-11:00	**J. E. Padgett (Rice University, USA)** **Keynote Lecture: Coastal resilience of chemical and petrochemical storage tanks**
11:00-11:15	**Coffee Break**
11:15-13:00	**M. Pozzi (Carnegie Mellon University, USA)** **Decision making, maintenance, operation and resilience**
13:00-14:00	**Lunch**
14:00-15:45	**E. Patelli (University of Liverpool, UK)** **Efficient simulation techniques for reliability and resilient analysis of complex systems.**
15:45-16:00	**Coffee Break**
16:00-17:45	**S. Marelli (ETH, Zürich; Switzerland)** **Metamodels for uncertainty quantification and structural reliability analysis**
17:45-18:00	**Closure and Acknowledgments**

Who should attend

Graduate students, postdoctoral researchers and practitioners willing to do research and applications in the field of nonlinear simulation/development of structures and infrastructures under extreme natural events

Registration

WORKSHOP REGISTRATION FEES

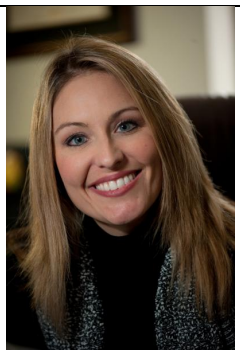
Early registration fee (until xxx)
EUR xxx - VAT 22% included

Late registration fee (after xxx)
EUR xxx - VAT 22% included

Registration fees include:
xxxxxxx

The registration form is available at
www.xxxxx.xxx

To register please send an e-mail to: fabrizio.paolacci@uniroma3.it by June 25, 2018

	**Prof. Jamie E. Padgett**, Rice University in Houston, USA. The research of Prof. Padgett focuses on the application of probabilistic methods for risk assessment of structural infrastructure, including the subsequent quantification of resilience and sustainability. Her work emphasizes infrastructure portfolios such as regional portfolios of bridges or oil storage tanks exposed to multiple hazards, including earthquakes, hurricanes, or aging and deterioration. She has published over 175 articles in journals or archived conference proceedings in the general area of structural response, reliability and life-cycle assessment. Dr. Padgett was the founding Chair of the ASCE technical committee on Multiple Hazard Mitigation, and is an active member of several national technical committees within ASCE and TRB. She currently serves on editorial boards for the ASCE Journal of Bridge Engineering, ASCE Journal of Structural Engineering, and Sustainable and Resilient Infrastructure. Dr. Padgett has received several awards and recognitions including the 2017 ASCE Walter L. Huber Civil Engineering Research Prize, and the 2017 (R+T)2 Award at Rice University for excellence in research and teaching. She also was awarded the 2011 National Science Foundation Faculty Early Career Development (CAREER) Award and the 2016 IALCCE Junior Award for "contributions to life-cycle analysis of structures". Among other projects, Dr. Padgett currently works as a part of several large national or regional research efforts including the NIST Center of Excellence for Community Disaster Resilience (headquartered at Colorado State University), the NSF NHERI Cyberinfrastructure "DesignSafe-CI" (headquartered at University of Texas, Austin), and the Severe Storm Prediction Education and Evacuation from Disasters (SSPEED) Center (headquartered at Rice University)
	**Prof. Cimellaro** Polytechnic of Turin, Italy. His primary field of investigation is Earthquake Engineering with emphasis on defining Quantification of Resilience of systems. Resilience is defined as the capacity of systems to rebound after severe disasters of any type. This is a new research field that embraces both theoretical and experimental aspects. It is an interdisciplinary research area that combines engineering with organizational, economical, and social aspects. Prof. Cimellaro's interdisciplinary research investigates representations of health system properties and processes, creating quantitative modeling solutions for a better understanding of sustainable use and resilience of systems that often challenges collaborating teams consisting of scientists, social scientists, engineers, lawyers and extension specialists across a wide spectrum of disciplines. His major contribution has been the quantification of the concept of disaster resilience in which a unified terminology and a common resilience framework is proposed that can be used for analyzing critical facilities (e.g. hospitals, military buildings, etc.), and utility lifelines (e.g. electric power systems, transportation networks, water systems etc.). His interdisciplinary recent research has focused on quantifying the social and economic impact of critical infrastructure disruption during disasters. The proposed framework can be used for describing the losses as well as the recovery process of any of the systems mentioned above; however, it can become more complex when comprehensive loss estimation or recovery models (e.g. meta-models for the case of health care facilities) are used. Even so, Dr. Cimellaro current research leads toward the definition of more complex recovery models that are able to describe the process over time and the spatial definition of recovery.
	**Dr Fabrizio Paolacci**, Roma Tre University, Italy. He is currently Assistant Professor in Structural Engineering at University Roma Tre – Department of Engineering. His main scientific interests are focused mainly on: a) Performance-based design of steel-concrete composite bridges, b) Assessment and reduction of the seismic risk of reinforced concrete buildings and bridges, c) Seismic risk of major-hazard industrial plants and applicability of innovative protection systems (base isolation and energy dissipation), e) Seismic vulnerability of high-voltage electric networks and substations and applicability of innovative seismic protection systems, f) Passive and semi-active control of structures. He gained a long standing experience in the management of research projects about experimental assessment of the seismic response of structures. He has been Visiting Scholar in 1999 at the Department of Civil and Environmental Engineering of University of California at Berkeley. From 2008 to 2013, he assumed the role of scientific coordinator of the Laboratory of Testing Materials and Structures of the Department of Structures of the University Roma Tre; currently He is the Chair of the Seismic Engineering Technical Committee of ASME PVP Division. Finally, He is author of more than 100 publications on International peer-reviewed Journals and conferences.

	**Dr Matteo Pozzi,** Carnegie Mellon University, USA. Matteo Pozzi obtained a Ph.D. in structural engineering from the University of Trento (2007), he was a post-doc researcher at UC Berkeley (2011-12) and since 2012 he is an assistant prof. in the Civil & Environmental Engineering dept. at Carnegie Mellon University, in Pittsburgh, Pennsylvania. His research deals with risk analysis and decision optimization for civil infrastructure systems, using engineering models and sensor data, and he teaches courses on Urban Systems Modeling and on Data Management. He is co-author of about 30 journal papers and in 2017 he got a CAREER Award from the National Science Foundation.
	**Prof. Oreste S. Bursi,** University of Trento, Italy. Oreste S. Bursi graduated in Mechanical Engineering at the University of Padua in 1984, and achieved his PhD. in Mechanical Engineering at the University of Bristol. He is full Professor of Structural Dynamics and Control at the University of Trento since 2001. He has always been interested in complex dynamical non-linear systems consisting of structural and mechanical components as well as control devices. Devices have been used both to control in real time or test dynamical systems subjected to natural hazards based on computer hardware and software. Thus, through the analysis and design of such complex systems that require both advanced modelling and simulation and experimental techniques, Oreste S. Bursi has built up his scientific background tailored to multidisciplinary problems. As a result, he became the leader researcher in Europe in the area of heterogeneous dynamic substructure coupling. Recently, he addressed his research interests towards system identification and structural health monitoring of complex systems, e.g. bridges, pipes, etc., and quantitative risk assessment of critical petrochemical facilities subjected to technological accidents triggered by natural disasters. http://r.unitn.it/en/dicam/nhmsdc http://me.unitn.it/oreste-bursi/
	Prof. Antonio C. Caputo, Roma Tre University, Italy
	Prof. E. Patelli, University of Liverpool, UK.,
	**Dr. Stefano Marelli**., ETH Zurich, Switzerland. Researcher in the fields of uncertainty quantification and structural reliability analysis, with a broad background in physics, statistics and computational methods. Focus on active-learning- and metamodelbased techniques, probabilistic modelling and scientific software development. Project leader of the UQLab project (www.uqlab.com). Lecturer at ETH Zürich in Structural Reliability and Risk Analysis and Uncertainty Quantification in Engineering.