

Seminar - April 20, 2017, 14:30 pm, room A7
Polytechnic School, University of Genoa, Via Montallegro 1, Genoa, 16145

**Mechatronics and ICT in the process
of cultural heritage and civil infrastructure management**

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Automatized survey, construction, inspection, maintenance, restoration and reconstruction have become challenging activities conducted during the process of cultural heritage and civil infrastructure management, due to the revolutionary impact of information technology and mechatronics in the routine operations. The complete process will be overviewed, during the seminar, considering different aspects related to the interconnection between classical engineering and architectural problems with the emerging technologies related to automation, robotics and information communication technologies (ICT). The impact of new technologies on data acquisition for survey, inspection, identification and monitoring will be firstly considered evidencing how the use of robotized systems and easy realizable sensor networks determines new sets of available data to be processed. Emphasis will be given to geometric data extracted through novel methodologies, the use of which will be discussed within the use of automated data acquisition systems. The integration among different information and numerical models will permit to evidence the novelties related to the use of ICT in order to build an exhaustive and unique description of the examined construction. Data and models will be then used to identify and to describe defects and degradation especially in view of determining possible reduction of integrity and reliability in existing structures. Finally it will be shown how all the acquired knowledge opportunely managed constitutes the input for automated or partially-automated decision making process useful in the control, retrofitting and management of large facilities and infrastructure. A series of example will be proposed, taken by the process of reconstruction of the city of L'Aquila.

Vincenzo Gattulli is currently associate professor of Solid and Structural Mechanics at the Department of Structural and Geotechnical Engineering at Sapienza University of Rome. He received Mastership of full professor in structural mechanics in 2014 and Mastership of full professor in structural engineering in 2015. Since 1990, Vincenzo's research has encompassed analytical, numerical and experimental methods in different fields of structural mechanics. Fundamental research themes concern: structural dynamics and stability, structural control and identification, structural reliability, earthquake engineering. Since 2005 he is PI for Univaq RU within the RELUIS National project supported by Protezione Civile working on innovative systems for seismic protection of structures. In 2006 is The General Secretary of the three-years SICON project, EU FP6 Marie Curie action. Since 2006 he is PI Univaq RU for several National Project PRIN, on the subject of dynamics and innovative identification and monitoring for structures. He is author (co-) of more than 180 papers, co-editor of one book, author of more than 20 invited chapters in books. He has been invited lecturer in several prestigious Universities all over the world: State University of New York at Buffalo, USA (1993-94), The Johns Hopkins University, USA (1997), University of Bristol, UK (2000), Universidade do Porto, FEUP (2006), University College of London, UK (2014), University of Illinois at Urbana-Champaign, USA (2015), Dalian University of Technology, China (2015), Cambridge University (2016). He is co-chairing the coming Eurodyn 2017 in September 2017 in Rome.

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