18TH WORLD CONFERENCE ON EARTHQUAKE ENGINEERING

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Session ID: AIM-1

Title

MACHINE LEARNING METHODS FOR SEISMIC SAFETY AND CONDITION ASSESSMENT OF BRIDGES AND INFRASTRUCTURES

Convenors

I. Venanzi [1], G. Uva [2], P. Rizzo [3]

Description

The safety evaluation and management of bridges and infrastructures is particularly important in areas highly prone to earthquakes, as these structures may have not been retrofit with the latest seismic design requirements and are approaching the end of their service life.

Some recent research efforts have looked at ways to enhance classic procedures of vulnerability analysis, risk assessment, structural health monitoring of infrastructural assets using artificial intelligence, and in particular Computer Vision, Machine Learning and Data Fusion approaches. In the context of structural engineering, these methods are useful, as they allow process automatization, improvement of the reliability of the results and reduction of numerical complexity.

This technical session aims to promote the exchange of ideas on problems, trends and recent advances related to the application to earthquake engineering of innovative approaches based on automation and artificial intelligence, with reference to the design and construction of new bridges and infrastructures, and to the monitoring, evaluation, maintenance, decision making and retrofit of existing structures.

We invite contributions related to the application of artificial intelligence to the design, risk analysis, monitoring of structures and infrastructures. Topics include but are not limited to:
- machine and representation learning;
- deep learning;
- transfer learning;
- computer vision;
- reinforcement learning;
- distributed ledger and blockchain.

Accordingly, this technical session fosters the dialogue between consultants and researchers active in the field of machine learning, bridges risk assessment and management, collecting methodology advancements as well as case studies and field experiences.

This technical session is organized under the auspices of FABRE Consortium (www.consorziofabre.it), the Italian scientific alliance on risk assessment and monitoring of civil infrastructural systems.

Invited Speakers

W. Salvatore [4], F. Ubertini [1], A. Dall'Asta [5], F. Paolacci [6], C. Mazzotti [7], F. Parisi [8], A. Downey [9]

Affiliations

[1] University of Perugia, Perugia, Italy, [2] Polytechnic University of Bari, Bari, Italy, [3] University of Pittsburgh, Pittsburgh, USA, [4] University of Pisa, Pisa, Italy, [5] University of Camerino, Camerino, Italy, [6] University of Rome La Sapienza, Rome, Italy, [7] Univeristy of Bologna, Bologna, Italy, [8] University fo Naples Federico II, Naples, Italy, [9] University of South Carolina, Columbia, USA, [10] University of Calabria, Cosenza, Italy