Politecnico di Torino

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CIVIL AND ENVIRONMENTAL ENGINEERING

Optimal design of civil structures

Funded By	Ministero dell'Università e della Ricerca - MUR [P.iva/CF:96446770586]
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Context of the research activity	The research activity covers the area of structural optimization of civil structures with the aid of artificial intelligence (AI) soft computing techniques. The idea is to bring artificial intelligence techniques to become a real aid to the current strategic decision processes. The research project aims at implementing an artificial intelligence architecture supporting users in design / assessment existing civil structures.
Objectives	The new challenges of civil engineering bring civil engineers to deal with computers science and electronics. The massive use of artificial intelligence in everyday life and the introduction of electronic devices for structural health monitoring (e.g. sensors) make the role of civil engineers more flexible with respect to the past. The research project will be co-funded by a company involved with the development of both software for structural analysis, and sensors for structural health monitoring. Potential outcomes of the combined use of optimization techniques together with be: - Frameworks for automated model updating for structural health monitoring of civil engineering - Frameworks for automated topological and sizing retrofitting optimization

	- Complex Finite Element model calibrations

Skills and competencies for the development of the activity	Relevant skills in mathematics and structural engineering. Good finite element modelling skills (e.g. modelling of 1D, 2D and 3D linear and nonlinear structural elements) Basics of computer programming (Matlab, Phyton, etc).