

ADAPTIVE AND COMPLIANT ENGINEERING STRUCTURES

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ABSTRACT

In order to meet the requirements of tomorrow's world, engineers and architects must design extremely efficient structures. Making engineering structures adaptive is a promising approach to reach that target. One approach to adaptive structures is to noticeably increase the load carrying efficiency of structures by the employment of sensors, actuators and control units. Hence, the active manipulation of the static and dynamic structural response (i.e., forces, deformations and vibrations) enables dramatic mass reduction of engineering structures while increasing their performance. Additionally, control and actuation allow adjustment to evolving requirements occurring during lifetime of a building. Examples include deployable and retractable structures, with significant changes between the configurations is another application of adaptive structures. Here, not only the motion, but also the structure itself needs to be designed to meet the requirement of compliance.

This mini-symposium focuses on load-carrying adaptive structures in general within civil engineering as well as on compliant adaptive structures. It is devoted to new approaches in the computational design, analysis and optimization of such structures including (but not limited to):

- modelling and simulation
- form finding and optimization
- optimal strategies for sensor and actuator placement

- active and passive control strategies
- criteria for the evaluation of adaptive engineering structures
- design of compliant structures and mechanisms
- design and analysis of deployable structures