Lehrstuhl für Systemtheorie und Regelungstechnik
Prof. Dr.-Ing. habil. J. Rudolph

Einladung

**zum Vortrag am Dienstag, 24.10.2017, 16.15 Uhr
in Gebäude A5 1, Hörsaal -1.22
im Rahmen unseres Instituts-Kolloquiums**

Herr
Dr. Gianluca Rizzello

Lehrstuhl für Intelligente Materialsysteme
Universität des Saarlandes

zum Thema

Model-Based Control and Self-Sensing Algorithms for Dielectric Elastomer Actuators

The term 'smart materials' refers to materials such as piezoelectrics, electro-active polymers, magnetostrictives and shape memory alloys, which exhibit a change in shape when solicited by an external stimulus, such as electric field, magnetic field, or temperature. Smart materials can be used as actuators and sensors at the same time, by exploiting the so-called 'self-sensing' feature. Self-sensing permits to realize feedback controlled systems, which do not require additional electromechanical transducers, thus allowing to significantly reduce cost and size of the devices. Despite their high potential, the performance of smart materials is currently limited by their highly nonlinear and hysteretic behavior, as well as by sensitivity to environmental conditions. Smart model-based algorithms can be combined with smart material systems to enable autonomous operations, to perform positioning tasks with high accuracy, speed and energy efficiency, as well as to adapt to changes in environmental conditions and to operate in sensorless fashion. In other words, model-based intelligent algorithms represent the key to exploit the 'smartness' of smart materials. The aim of this talk is to illustrate some recent research developments in the field of Dielectric Elastomer (DE) actuators, a specific class of smart material systems. The topics discussed in this talk include physics-based modeling of DE systems, development of model-based motion control algorithms, implementation of self-sensing based feedback control architectures, and experimental validation of the proposed methodologies.

Alle Interessenten sind herzlich eingeladen.

Prof. Dr.-Ing. habil. J. Rudolph