

Special Issue

Estimation, Control and Self-Sensing Approaches for Microelectromechanical (MEMS) Systems

Message from the Guest Editors

Microelectromechanical systems (MEMS) have been a catalyst for innovation, giving rise to new types of applications in smart homes, wearables, and the Internet of Things (IoT) which were not possible with traditional technologies. MEMS technology enables for device miniaturization and utilizes unconventional physics at the nanoscale for sensing and actuation. Compared to macroscopic systems, the internal state estimation and control of miniaturized systems can be challenging due to their small size. In resource-limited MEMS devices, integrated sensing capabilities are important to allow for the autonomous monitoring of system states without separate sensors or external inputs, which enables for physically intelligent responses to changes. Various integrated sensing mechanisms are available in MEMS smart devices, making use of piezoresistive, piezoelectric, capacitive, thermal, and optical effects. Original research work and review articles covering topics including the modeling, fabrication, integration, actuation, sensing, signal processing, state estimation and control of MEMS devices are all welcome.

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