Special Issue

Innovative Actuators Based on Shape Memory Alloys

Message from the Guest Editors

Shape memory alloys (SMA) provide unique opportunities for designing actuators with diverse innovative applications in industry, medicine, robotics and life. The high-power density of SMAs is a prerequisite for creating one of the most compact actuators compared to many others based on conventional drives, such as electric motors, hydraulic and pneumatic cylinders, combustion engines, etc. In addition, the specific properties of SMAs allow the development of actuators with diverse functionalities and minimal building elements. The thermal drive of SMAs with one-way and two-way shape memory effect, combined with high-energy density, is an excellent precondition for designing competitive micro- and nano-actuators with applications in medicine, microrobotics and microfluidic systems. This Special Issue intends to provide a forum for researchers and developers to share ideas, current trends and achievements related to SMA-driven actuators. Original and innovative research papers from both academia and industry are welcome.

Guest Editors

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Deadline for manuscript submissions

closed (30 April 2025)

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About the Journal

Message from the Editorial Board

We are just entering the Next Wave of Technology (NWT) where actuators will play the same role as the computer chip did for computers/social media approximately four decades ago. Just in the U.S., production of $1 trillion year of electromechanical systems (vehicles, orthotics, manufacturing cells, freight trains, aircraft, etc.) will be impacted by the NWT, all driven by actuators. Five key trends can be found for the future perspectives: “Performance to Reliability”, “Hard to Soft”, “Macro to Nano”, “Homo to Hetero” and “Single to Multi functional”. We invite papers that primarily impact these economic sectors; those illustrating basic scientific principles are also welcome.

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