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Advanced Technologies in Soft Actuators

Guest Editors:

Dr. Mahato Manmatha
Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea

Dr. Jaehwan Kim
Department of Mechanical System Engineering, Kumoh National Institute of Technology, Daejeon, Republic of Korea

Deadline for manuscript submissions:
closed (30 April 2025)

Message from the Guest Editors

Dear Colleagues,

Soft robotics and actuators show great promise by enabling the control of machines and systems that rigid robots and actuators cannot achieve. Their flexibility and adaptability make them ideal for interacting with delicate objects and living organisms in complex and dynamic environments. Typically, soft actuators require a control signal and an energy source to function. These control signals cause the actuators to deform, converting input energy into mechanical motion used to operate machines or systems. Various stimuli, such as electrical or magnetic fields, heat, light, humidity, pH, chemicals, hydraulics, and pressure, can be used to activate the actuators. Soft actuators are typically made of stimuli-responsive materials with different mechanisms.

The aim of this Special Issue is to present those advanced technologies that are useful for the further development of soft actuators for real-world applications.

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Editors-in-Chief

Prof. Dr. Kenji Uchino
Emeritus Academy Institute, The Pennsylvania State University, University Park, PA 16802, USA

Prof. Dr. Norman M. Wereley
Department of Aerospace Engineering, University of Maryland, 3179J Martin Hall, College Park, MD 20742, USA

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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Contact Us

Actuators Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland

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