Special Issue

Recent Advances in Intelligent Control Methods for Soft Robotics

Message from the Guest Editor

In the last two decades, soft robots have been at the forefront of robotics research because of several advantages offered by their compliant structure (e.g., due to the adaptability in unstructured environments) in contrast to rigid robots typically applied in industry. However, the price paid for this softness takes the form of more challenging modeling and control, where several important aspects, such as infinite-degrees-of-freedom continuum structures as well as the presence of significant hysteresis/creep effects or other nonlinear and time-varying properties, need to be taken into account. Machine learning techniques can address these issues using either model-free or hybrid approaches. This Special Issue is dedicated to the latest advances in the field of machine learning with application to soft robotics, either to any soft robot component (e.g., soft actuators or sensors) or to robots as a whole. Especially welcome are deep learning models and methods as well as the use of third-generation neural networks (SNNs).

Guest Editor

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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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