actuators

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Variable Stiffness Actuators

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Deadline for manuscript submissions:
closed (31 December 2020)

Message from the Guest Editors

Dear Colleagues,

The application of compliant actuators is pursued for various reasons, including safe human-machine interactions, the imitation of physiological muscle characteristics, the reduction of peak torque, peak performance, and energy consumption. As multivariable systems, actuator systems equipped with adjustable compliance require special control methods. Some application scenarios for these modern actuator topologies are bipedal gait, support at work or in everyday life, rehabilitation robotics, and industrial motion control.

Contributions from all areas of compliant actuators are welcome in this Special Issue, particularly the following:

- Rehabilitation Robotics: Variable stiffness actuators to support the lower limb;
- Design: Variable Stiffness Actuator design and experimental validation of prototypes;
- Energy Analysis: Efficiency enhancement with actuators containing elastic elements;
- Support in everyday life: Actuators for motion support (e.g., elderly people);
- Control Systems: Control of systems including compliant actuators;
- Industrial Application: VSA for use in motion support and automated processes.

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Special Issue

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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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