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Artificial Muscles for Biorobotics: Study, Application and Future Perspectives

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Deadline for manuscript submissions:
closed (30 March 2023)

Message from the Guest Editors

Dear Colleagues,

The first examples of artificial muscles can be traced back to the 1950s, with the invention of the McKibben pneumatic muscle. This type of actuator, thanks to its intrinsic flexibility and biomimetics, immediately found numerous applications in the fields of biomechanics and soft robotics. In recent years, the evolution of materials technology has led to the creation of new examples of artificial muscles, which can exploit novel pneumatic actuator shapes, as well as shape memory alloys or new dielectric elastomers. All this, together with the use of original control techniques, has led to amazing developments in the biorobotics field—that is, the creation of robotic devices interacting with biological organisms, or able to imitate them (biomimetic robotics).

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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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