Special Issue

Design and Application of Actuators with Multi-DOF Movement

Message from the Guest Editor

With the increasing demand of industrial automation and robots around the world for a multi-degree-of-freedom (DOF) motion mechanism, a motion mode for actuators has been developed from simple 1-DOF motion to a multi-DOF motion and application of humanoid is actively proceeding. Along with recent advances in materials sciences, stretchable electronics, and mechatronics, the research and development of multi-DOF actuators is rapidly increasing. The reasons lie in their multifunctionality, low cost, fast response, high repeatability, and small size, making them a promising solution for the industrial automation and robots. Applications of multi-DOF actuators cover a wide range of fields such as robotics, joints and eyeballs of the humanoid, haptic device for an augmented reality system, camera modules, data storage devices, projectors, optics, optoelectronics, and medical and mechanical engineering, to name a few, which are expected to expand substantially in the years and decades ahead.

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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