

Editorial

Special Issue Kinematics and Robot Design VI, KaRD2023

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What would our concept of life be without motion? Motion is what makes life visible in living beings, and motion description/generation (i.e., kinematics) somehow describes living objects. This perspective guides many scientists working in the field of kinematics, and kinematics in robotics and mechatronics best interprets this.

Robots, first appearing in the form of industrial machines, as an evolution of automatic machines, have today entered into the everyday lives of people in the form of service robots, guiding important changes in lifestyle. Such changes are reshaping society in many fields, and a wide-ranging community of scientists is involved in this social evolution.

Kinematics is central to nearly all the design aspects of robotic/mechatronic systems. Topics, such as the analysis and synthesis of mechanisms; robot modeling and simulation; robot control, mobility and singularity analysis; performance measures; accuracy analysis; path planning and obstacle avoidance; collaborative robotics; novel manipulator architectures; metamorphic mechanisms; compliant mechanism analysis and synthesis; micro/nano-manipulator design; origami-based robotics; medical and rehabilitation robotics; and bioinspired robotics, deal with kinematics. All these topics have a deep social impact and help to delineate future perspectives on human welfare, which makes kinematics a thriving research field with theoretical and applicative subjects.

The series of Special Issues on “Kinematics and Robot Design” (KaRD) offers, to the vast community of scientists involved in these topics, a virtual setting, where new ideas and new applications can be presented and discussed by implementing the “open science” principles. Open science is the way the scientific community shows the rest of the world the strength of cooperation among individuals and nations in attaining better conditions for humankind. In addition, through open science practice, the same community stresses that the highest level of cooperation is attainable only in a peaceful world, where individuals and nations respect each other and refuse wars.

The KaRD series began in 2018, and in 2023, it published its sixth edition (KaRD2023). KaRD2023 collected fifteen submissions and, after a rigorous review process, accepted and published ten papers.

The ten papers published in the Special Issue “Kinematics and Robot Design VI, KaRD2023” address both theoretical and applicative aspects of the mechanism synthesis [1,2], geometric error effects [3], and instantaneous kinematics [4] of industrial robots, medical robotics [5,6], the path planning of mobile robots [7] and under-actuated robots [8], and robot control [9,10].

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