

Italian Advances on MMS

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The aim of this Special Issue is to disseminate recent developments in the field of Mechanism and Machine Science achieved by the Italian community through international collaborations, ranging from theoretical contributions to experimental and practical applications. It contains selected contributions that were accepted for presentation at the 3rd International Conference of the International Federation for the Promotion of Mechanism and Machine Sciences (IFTToMM) Italy, IFIT2020, which was hosted virtually in Napoli from 9 to 11 September 2020.

This IFIT conference was the third event in a series that was established in 2016 by IFTToMM Italy in Vicenza to bring researchers, industry professionals, and students from the Italian and international communities together in an intimate, collegial, and stimulating environment.

The IFTToMM Italy is one of the original member organizations of IFTToMM, which was founded in 1969. Since then, the member organization IFTToMM Italy has been active with contributions at the national and international levels, and in 2014, IFTToMM Italy was legally established as the Italian IFTToMM society.

This Special Issue includes papers belonging to a broad range of disciplines in the area of Mechanism and Machine Science such as robotics, kinematics of mechanisms, dynamics and control of ground vehicles, bearings, and medical devices.

These contributions were selected from among the 100 papers that were presented at the IFIT2020 conference to have extended, revised versions of the presented works. Most of them are those granted award recognition in one of the three IFTToMM categories of research, applications, and student. These papers were evaluated again with a blind peer-review process to confirm the high quality of the works.

Some of the papers published in this Special Issue address topics that fall within the area of robotics. Specifically, in Reference [1], the authors illustrate the results of a research that allowed to design, prototype and test a (2-RRU)-URR parallel mechanism for thumb rehabilitation therapy, while an analysis of a wearable robotic system for ankle rehabilitation is proposed in Reference [2]. Position and singularity analysis of a class of planar parallel manipulators with a reconfigurable end-effector is the subject of Reference [3]. A comprehensive control strategy for obstacle avoidance in redundant manipulation, consisting of a combination of offline path planning algorithms with online motion control, is presented in Reference [4]. Control of mechanical systems is also the subject of the investigation reported in Reference [5], where the use of a 3D camera is proposed to develop a contactless system for displacement monitoring and control.

In Reference [6], the authors illustrate a novel design concept that uses shape memory alloy wires, driven by fluid temperature, to achieve scalable output linear actuation.

Automotive engineering and vehicle dynamics are other areas of attention for the papers published in this Special Issue. The authors of Reference [7] propose an innovative design that allows for the improvement of efficiency in electric vehicles by exploiting a dual-motor planetary transmission. The advantages of using object-oriented programming for concurrent simulations of vehicle dynamics are illustrated in Reference [8], while an



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analytical study of the cornering behavior of an articulated tracked vehicle is reported in Reference [9].

In Reference [10], the authors show the results of long-lasting tests aimed at supporting and validating the definition of damage indices for railway axle bearing.

Finally, a smart stent that allows for monitoring eventual restenosis is investigated in Reference [11] by computational fluid dynamic and finite element analysis in descending thoracic aorta.

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Conflicts of Interest: The authors declare no conflict of interest.

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