

# Preface

We are glad to present the proceedings of the 8th International Conference on Robotics in Education (RiE) held in Sofia, Bulgaria, during 26–28 April 2017. The RiE is organized every year with the goal to provide the opportunity for the presentation of relevant novel research and development in a strongly multidisciplinary context in the educational robotics domain.

Educational robotics is an innovative way for increasing the attractiveness of science education and scientific careers in the view of young people. Robotics represents a multidisciplinary and highly innovative domain encompassing physics, mathematics, informatics and even industrial design as well as social sciences. As a multidisciplinary field, it promotes the development of systems thinking and problem-solving. Due to various application areas, teamwork, creativity and entrepreneurial skills are required for the design, programming and innovative exploitation of robots and robotic services. The fascination for autonomous machines and the variety of fields and topics covered make robotics a powerful idea to engage with. Robotics confronts the learners with the areas of Science, Technology, Engineering, Arts and Mathematics (STEAM) through the design, creation and programming of tangible artifacts for creating personally meaningful objects and addressing real-world societal needs. Thus, young girls and boys can easily connect robots to their personal interests and share their ideas. As a consequence, it is regarded as very beneficial if engineering schools and university programme studies include the teaching of both theoretical and practical knowledge on robotics. In this context, current curricula need to be improved and new didactic approaches for an innovative education need to be developed for improving the STEAM skills among young people. Moreover, an exploration of the multidisciplinary potential of robotics towards an innovative learning approach is required for fostering the pupils' and students' creativity leading to collaborative entrepreneurial, industrial and research careers.

In these proceedings, we present the latest results and development in educational robotics research and application. The book offers a range of methodologies for teaching robotics and presents various educational robotics curricula and activities. Moreover, the book introduces interesting programming approaches as

well as new applications, technologies, systems and components for educational robotics. The presented applications cover the whole educative range, from elementary school to high school, college, university and beyond, for continuing education and possibly outreach and workforce development. In total, 47 papers were submitted and 29 papers are now part of these proceedings after a careful peer review process. We would like to express our thanks to all authors who submitted papers to RiE 2017, and our congratulations to those whose papers were accepted.

This publication would not have been possible without the support of the RiE International Program Committee and the Conference Co-chairs. We also wish to express our gratitude to the volunteer students and staff of the partner organizations, which significantly contributed to the success of the conference. All of them deserve many thanks for having helped to attain the goal of providing a balanced event with a high level of scientific exchange and a pleasant environment. RiE 2017 was greatly supported by SAP Labs Bulgaria, Avitel and Sofia Tech Park, for which we thankfully express our gratitude. We acknowledge the use of the EasyChair conference system for the paper submission and review process. We would also like to thank Dr. Thomas Ditzinger, Jeyashree Kumar and Springer for providing continuous assistance and advice whenever needed.

Robotics in Education

Latest Results and Developments

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