

# Preface I

Dear Colleagues and Friends,

Space robotics is a fascinating field that was developed for space exploration and space missions. Space is a hostile environment for humans and could not be explored earlier because of technological factors. Simply speaking, our technology in the past was not advanced enough to allow us to venture safely into space. Also, in many cases, traveling in space takes more than a human's life span. This is exactly the reason why we have to use robots of a variety of sorts and types. Robots allow humans to extend their abilities to perform missions that otherwise would be dangerous or simply impossible. Robots make long-duration missions not only possible but also present opportunity for exploration of the solar system safely and efficiently. The space automation and autonomous missions are also a viable solution to deep space travel and exploration problems.

One of the issues that needs urgent solution is the problem of space debris removal from Earth high orbits. One of the viable possibilities is the application of robotics including spacecraft base with two-arm manipulator.

It is with great pleasure that we would like to show once more to the international space robotics community, selected papers presented at the **II Conference on Aerospace Robotics** held in Warsaw, Poland during 1–2 July 2013.

We have selected 18 papers from the conference that reflect the interests and topics of all papers presented at this conference. This book includes papers ranging from space manipulators control and applications to mobile robots and sample taking instrumentation.

We hope that our readers will find these papers not only interesting but also helpful and inspiring in their professional activities.

Warsaw, June 2014

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## Preface II

Dear Friends,

It is with great pleasure that we invite the international robotics community to the II Conference on Aerospace Robotics to be held in Warsaw, Poland during 1–2 July 2013.

This is a time that is particularly important for the Polish aerospace robotics community. In July 2012, the European Space Agency Council unanimously approved the accession of Poland to the ESA Convention. In November 2012, Polish President Bronisław Komorowski signed the final ratification documents and Poland became the 20th member of the Agency. The timing was significant because soon after, an important meeting was held, where the ESA space policy for the next decade was discussed and shaped.

Without any doubt, it is also a singular moment in terms of global space exploration. In August 2012, as a part of NASA Mars Science Laboratory, Curiosity rover landed on the surface of Mars. On the other hand, the European Space Agency is planning to launch two missions to Mars—ExoMars (possible launch in 2016), as a part of the Aurora Program, and Mars Sample Return Mission, in cooperation with NASA, planned for 2020–2022.

However, Space Agencies are not the only entities interested in shaping the priorities for the development of space activities. The European Union Commission itself is an important player in designing and shaping space sector activities and policies. Article 189 of the Lisbon Treaty gives the EU an explicit role in designing a policy for the exploration and exploitation of space; the European Union space policy is a key element of the Europe 2020 strategy and an integral part of the European industrial policy. Flagship space projects of the EU include the development of the European navigation satellite program Galileo, and the implementation of the Copernicus (previously named European Global Monitoring for Environment and Security—GMES) program.

The Polish space community activities are synchronized with broader European activities and for a number of years Polish institutes, universities, and private companies have subscribed to the priorities defined by ESA or EU and cooperated with European partners. This includes Polish participation in GMES, EGNOS,

Space Situational Awareness, collaboration with ESA within the framework of PECS (Plan for European Cooperating State) Charter, and many more.

We hope that our II Conference on Aerospace Robotics will help in promoting development and cooperation within the robotics community.

We would like to thank the Space Research Centre (CBK PAN) in Warsaw for their organizational and financial support of this conference. Also, we would like to thank all CBK PAN employees for their time and efforts devoted to this conference. In particular, we thank Dr. Karol Seweryn for his valuable contributions and immeasurable devotion.

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