Editorial

According to a tradition initiated in 1985, every 2 or 3 years a National Conference on Robotics takes place in Poland that provides roboticians from both the academia and the industry with a convenient forum for presenting their results, discussing problems, exchanging views, and laying out perspectives for future work. From the very beginning these Conferences have been organized by the Institute of Engineering Cybernetics, Wrocław University of Technology. The last, 8^{th} National Conference on Robotics took place on 23rd–25th of June, 2005 in Polanica-Zdrój. This special issue of the *Bulletin of the Polish Academy of Sciences: Technical Sciences* contains the papers based on selected plenary talks and technical presentations delivered at this conference. The papers have been selected in such a way that reflect main topics that have come across the conference, concerned with various aspects of robotics research and design of robots.

The special issue is opened out by an invited paper entitled *Stability of Positive Linear Discrete-Time Systems* by G. James from Coventry University, UK, and V. Rumchev from Curtin University of Technology, Perth, Australia, examining mutual relations between asymptotic stability, controllability and structure of positive, linear, discrete-time control systems. The invited paper has been recommended by the Editor in Chief of the Bulletin, Prof. T. Kaczorek. The following 9 papers are connected with the 8^{th} National Conference on Robotics. They deal with the design and control of stationary manipulators, mobile manipulators and mobile robots, sensor data acquisition in robots, foundations of robot programming and automatic reasoning as well as robot design. Specifically, the paper *Multi Criteria Optimum Design of Manipulators* by M. Ceccarelli, G. Carbone and E. Ottaviano from the University of Cassino, Italy, based on a plenary talk presented by Prof. M. Ceccarelli, addresses the problem of multi-objective optimum design of serial and parallel robotic manipulators. The next paper, *Unfalsified Control of Manipulators: Simulation Analysis*, by M. Pawluk from Warsaw University of Technology and K. Arent from Wrocław University of Technology, Poland, is developing a new paradigm in adaptive control of manipulators based on the methodology of unfalsified control set forth by Safonov and Tsao. The paper entitled *New Approach to Designing Input-Output Decoupling Controllers for Mobile Manipulators* by A. Mazur from Wrocław University of Technology improves earlier results on input-output decoupling for mobile manipulators obtained by Yamamoto and Yun. The paper written by Z. Hendzel form Rzeszów University of Technology, Poland, entitled *Collision Free Path Planning and Control of Wheeled Mobile Robot Using Kohonen Self-Organising Map*, proposes a sensor-based, reactive navigation method for mobile robots in unknown 2D environments populated with static obstacles. The following paper *A Two-Step Approach to Blind Deconvolution of Speech and Sound Resources in the Time Domain*, authored by F. A. Okazaki and W. Kasprzak from Warsaw University of Technology is devoted to the reconstruction by a robot of the correct speech signal from disturbed signals emitted by several sound sources. Another plenary talk presented at the Conference has been embodied into the paper by C. Zieliński from Warsaw University of Technology, entitled *Formal Approach to the Design of Robot Programming Frameworks: The Behavioural Control Case*, concerned with formal specifications of multi-robot system controllers. The paper *Reasoning with Limited Resources: Active Logics Expressed as Labelled Deductive Systems* by M. Asker and J. Malec from Lund University, Sweden, based on a plenary talk delivered by J. Malec, promotes the choice of labelled deductive systems as a tool for reasoning with limited time and memory resources in robotic systems. The last two papers have come from two special sessions held at the Conference, and refer to two major recent achievements in the area of robotic construction in Poland. The paper *RobIn Heart 0, 1, and 3 – Mechanical Construction Development*, written by L. Podsędkowski from Technical University of Łódź describes the birth, the development and the present design state of the Polish cardiosurgical telemanipulator. The paper *Neutralising and Assisting Robot SMR-100 Expert – Design Problematics*, by P. Szynkarczyk from Industrial Research Institute for Automation and Measurements in Warsaw, presents the development of the construction of a "pyrotechnic" robot capable of defusing bombs or explosives, both indoors as well as outdoors.

Concluding this short overview of the contents of this special issue, I'd like to express my gratitude to Professor T. Kaczorek, the Editor in Chief of the Bulletin and to Professor J. Klamka, the Member of the Board of Co-editors for having generously rendered the Bulletin accessible to the contributors of the National Conference on Robotics, and patiently promoted the editorial work. I'm also indebted to Professor A. Borkowski, the Member of Scientific Committee of the National Conference on Robotics for presenting the initiative of dedicating this special issue of Bulletin to robotics.

Krzysztof Tchoń
Guest Editor

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