

Preface

Broadly perceived control, automation, robotics and measuring techniques belong to the most relevant fields of science and technology, both from the point of view of theoretical challenges and practical importance. In spite of being separate areas of research, knowledge and expertise, they are strongly related, in terms of paradigms and tools and techniques employed, as well in terms of their industrial scope of applications. Therefore, an industrial, practice-oriented perspective is an important aspect of these areas. Moreover, automation, robotics and measuring techniques have a significant innovative potential as the current industrial practice calls for a further integration of all kinds of production systems, more ecological and energy efficient solutions as well as cost- and time-effective production and manufacturing processes.

Among many important problems and challenges faced by automation and control, most of which have been reflected in the scope of the papers included in this volume, one can mention, for instance, discrete systems, actuators, diagnostics and modern tools exemplified by fuzzy logic, evolutionary computation, neural networks, probabilistic approaches, etc.

In robotics, in particular in its part related to the development of mobile robots, one can quote as crucial problems and challenges various problem solving tasks related to the control of walking robots, control of manipulators, motors and drivers, mechatronic systems, and tracking control.

Measuring techniques and systems have to overcome, first of all, barriers implied by environmental conditions and limitations. They call for the development of novel sensors (also utilizing novel materials such as graphene), advanced signal processing and a more foundational development focused on the theory of metrology.

This book presents the recent advances and developments in control, automation, robotics and measuring techniques that are trying to meet those challenges and to fulfil those technological, economic and social needs. It presents contributions of top experts in the fields, focused on both theory and industrial practice. The particular chapters present a deep analysis of a specific technical problem, which is

in general followed by a numerical analysis and simulation, and results of an implementation for the solution of a real-world problem.

We strongly believe that the presented theoretical results, practical solutions and guidelines will be useful for both researchers working in the area of engineering sciences and practitioners solving industrial problems.

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Jan Awrejcewicz
Krzysztof J. Kaliński
Roman Szewczyk
Małgorzata Kaliczyńska

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Awrejcewicz, J.; Kaliński, K.J.; Szewczyk, R.; Kaliczyńska, M.
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