

# Preface

Given collected articles have been organized as a result of open joint academic panels of research workers from Faculty of Mechanics and Mathematics of Lomonosov Moscow State University and Institute for Applied Systems Analysis of the National Technical University of Ukraine “Kyiv Polytechnic Institute,” devoted to applied problems of mathematics, mechanics, and engineering, which attracted attention of researchers from leading scientific schools of Brazil, France, Germany, Poland, Russian Federation, Spain, Mexico, Ukraine, USA, and other countries. Modern technological applications require development and synthesis of fundamental and applied scientific areas, with a view to reducing the gap that may still exist between theoretical basis used for solving complicated technical problems and implementation of obtained innovations. To solve these problems, mathematicians, mechanics, and engineers from wide research and scientific centers have been worked together. Results of their joint efforts, including applied methods of modern algebra and analysis, fundamental and computational mechanics, nonautonomous and stochastic dynamical systems, optimization, control and decision sciences for continuum mechanics problems, are partially presented here. In fact, serial publication of such collected papers to similar seminars is planned.

This is the sequel of earlier two volumes “Continuous and Distributed Systems: Theory and Applications.” In this volume, we are focusing on recent advances in dynamical systems and control (theoretical bases as well as various applications):

- (1) we benefit from the presentation of modern mathematical modeling methods for the qualitative and numerical analysis of solutions for complicated engineering problems in physics, mechanics, biochemistry, geophysics, biology, and climatology;
- (2) we try to close the gap between mathematical approaches and practical applications (international team of experienced authors closes the gap between abstract mathematical approaches, such as applied methods of modern analysis, algebra, fundamental and computational mechanics, nonautonomous and

stochastic dynamical systems, on the one hand, and practical applications in nonlinear mechanics, optimization, decision-making theory, and control theory on the other); and

- (3) we hope that this compilations will be of interest to mathematicians and engineers working at the interface of these fields.

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Victor A. Sadovnichiy  
Mikhail Z. Zgurovsky

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Sadovnichiy, V.A.; Zgurovsky, M.Z. (Eds.)

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