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Control Systems: Theory and Applications

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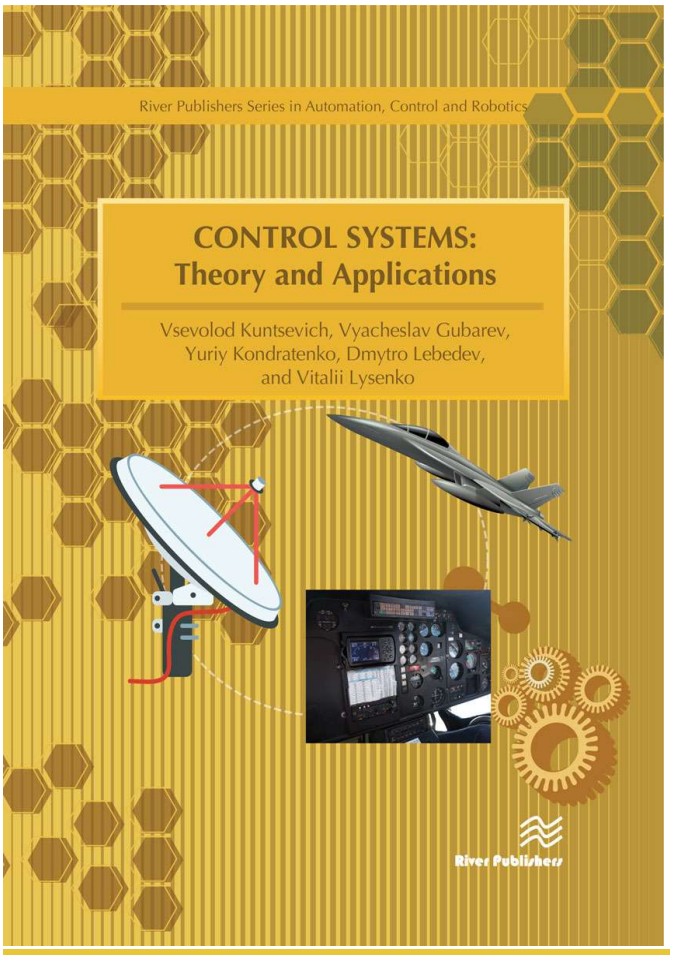
In recent years, a considerable amount of effort has been devoted, both in industry and academia, towards the development of advanced methods of control theory with focus on its practical implementation in various fields of human activity such as space control, robotics, control applications in marine systems, control processes in agriculture and food production.

Control Systems: Theory and Applications consists of selected best papers which were presented at XXIV International conference on automatic control "Automatics 2017" (September 13-15, 2017, Kyiv, Ukraine) organized by Ukrainian Association on Automatic Control (National member organization of IFAC - International Federation on Automatic Control) and National University of Life and Environmental Sciences of Ukraine. More than 120 presentations where discussed at the conference, with participation of the scientists from the numerous countries.

The book is divided into two main parts, a first on Theory of Automatic Control (5 chapters) and the second on Control Systems Applications (8 chapters). The selected chapters provide an overview of challenges in the area of control systems design, modeling, engineering and implementation and the approaches and techniques that relevant research groups within this area are employing to try to resolve these.

This book on advanced methods of control theory and successful cases in the practical implementation is ideal for personnel in modern technological processes automation and SCADA systems, robotics, space and marine industries as well as academic staff and master/research students in computerized control systems, automatized and computer-integrated systems, electrical and mechanical engineering



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KEYWORDS:
Invariant sets, bounded perturbations, discrete control systems, nonlinear systems; set-valued mapping, conflict-controlled process, Pontryagin's condition, superpositional measurability, fractional derivative, Mittag-Leffler function; cognitive map, impulse process, identification problem, subspace method, ill-posed problem, closed-loop control system; supply network, inventory control, guaranteed cost control, invariant ellipsoid, Lyapunov-Krasovskii functional, linear matrix inequality, semidefinite programming; method of non-dimensionization, nonlinear dynamics problems, analytical solution, experimental data, Buckingham's theorem; energy efficiency, smart control, situational models, logical conditions, energy consumption, oscillatory regime, relay system, fuzzy control, simulation; pose estimation, uncooperative spacecraft, computer vision, machine learning, ellipsoidal estimation, guaranteed estimation; fuzzy controller; synthesis; optimization; automatic control system; floating dock; docking operations; automation of control processes, multi-assortment production, logical-dynamic models, intelligent systems, case control; coordinate determination, space images, orbital data, calibration procedure, sub-satellite polygon, point landmarks; control algorithms, microclimate, robotic complexes, greenhouse; UAV, stress indices, nitrogen,

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