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Editorial

Qualitative Analysis of Differential, Difference Equations, and Dynamic Equations on Time Scales

Tongxing Li,[1] Josef Diblík,[2,3] Alexander Domoshnitsky,[4] Yuriy V. Rogovchenko,[5] Felix Sadyrbaev,[6] and Qi-Ru Wang[7]

[1] *School of Informatics, Linyi University, Linyi, Shandong 276005, China*
[2] *Department of Mathematics and Descriptive Geometry, Faculty of Civil Engineering, Brno University of Technology, 602 00 Brno, Czech Republic*
[3] *Department of Mathematics, Faculty of Electrical Engineering, Brno University of Technology, 616 00 Brno, Czech Republic*
[4] *Department of Mathematics and Computer Sciences, Ariel University, 40700 Ariel, Israel*
[5] *Department of Mathematical Sciences, University of Agder, P.O. Box 422, 4604 Kristiansand, Norway*
[6] *Institute of Mathematics and Computer Science, University of Latvia, Rainis Boulevard 29, Riga LV-1459, Latvia*
[7] *School of Mathematics and Computational Science, Sun Yat-sen University, Guangzhou 510275, China*

Correspondence should be addressed to Tongxing Li; litongx2007@163.com

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It is our pleasure to present this special issue. Differential, difference, and dynamic equations on time scales are often used for modeling various problems arising in the engineering and natural sciences. Therefore, analysis of qualitative properties of solutions to such equations is crucial for applications. It is important to develop new efficient methods, as well as to modify and refine well-known techniques adjusting them for the analysis of new classes of problems.

In the call for papers prepared by the Guest Editors, we encouraged submission of state-of-the-art contributions on a wide spectrum of topics including asymptotic behavior of solutions, oscillation and nonoscillation, solvability of boundary value problems, existence of periodic and almost periodic solutions, stability properties of solutions, and applications to real world phenomena. This invitation was warmly welcomed by the mathematical community; more than sixty manuscripts addressing important problems in related areas were submitted to the Editorial Office and went through a thorough peer refereeing process. Thirty-eight research articles and two review articles reflecting modern trends and advances in functional differential, difference, and dynamic equations on time scales have been selected for this special issue.

In the contribution by Y. Zhang et al., an adaptive scheme that can be used to analyze an open-circuit voltage of a battery is presented. H. Xi et al. study global behavior of a class of difference equations. In the paper by R. Guo, an improved average dwell time method is utilized to establish a number of stability results for a class of switched nonlinear systems. L. Gao et al. study a class of third-order nonlinear delay dynamic equations on time scales, whereas Q. Zhang et al. deal with a class of third-order nonlinear functional differential equations. Both papers establish sufficient conditions which ensure that every solution of a given equation is either oscillatory or converges to zero. For a class of two-dimensional nonlinear dynamic systems on time scales with a forced term, X. Zhang and S. Zhu obtain sufficient conditions for all solutions to be oscillatory. D. Cai et al. introduce a generalized Solow-Swan model for the analysis of the exogenous impact of population, saving rate, technological change, and labor participation rate on the economic growth. Y.-C. Qiu and Q.-R. Wang establish new oscillation results for a class of second-order nonlinear damped dynamic equations of a more general form. Y. Sun and T. S. Hassan present new oscillation criteria for a class of second-order nonlinear dynamic equations.