

Applicable Solutions in Non-Linear Dynamical Systems

Editors

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PREFACE

The 15th International Conference “Dynamical Systems - Theory and Applications” (DSTA 2019, 2-5 December, 2019, Lodz, Poland) gathered a numerous group of outstanding scientists and engineers who deal with widely understood problems of theoretical and applied dynamics.

Organization of the conference would not have been possible without great effort of the staff of the Department of Automation, Biomechanics and Mechatronics of the Lodz University of Technology. The patronage over the conference has been taken by the Committee of Mechanics of the Polish Academy of Sciences and Ministry of Science and Higher Education of Poland.

It is a great pleasure that our event was attended by over **180** researchers from **35** countries all over the world, who decided to share the results of their research and experience in different fields related to dynamical systems.

This year, the DSTA Conference Proceedings were split into two volumes entitled “*Theoretical Approaches in Non-Linear Dynamical Systems*” and “*Applicable Solutions in Non-Linear Dynamical Systems*”. In addition, DSTA 2019 resulted in three volumes of Springer Proceedings in Mathematics and Statistics entitled “*Control and Stability of Dynamical Systems*”, “*Mathematical and Numerical Approaches in Dynamical Systems*” and “*Dynamical Systems in Mechatronics and Life Sciences*”. Also, many outstanding papers will be recommended to special issues of renowned scientific journals.

The DSTA Conference Proceedings include papers covering the following topics:

- asymptotic methods in non-linear dynamics,
- bifurcation and chaos in dynamical systems,
- control in dynamical systems,
- dynamics in life sciences and bioengineering,
- engineering systems and differential equations,
- non-smooth systems
- mathematical approaches to dynamical systems
- original numerical methods of vibration analysis,
- stability of dynamical systems,
- vibrations of lumped and continuous systems,
- other problems.

Proceedings of the 15th Conference „Dynamical Systems - Theory and Applications” summarize **106** papers of university teachers and students, researchers and engineers from all over the world. The papers were selected by the Scientific Committee of DSTA 2019 from **360** papers submitted to the conference. Therefore, the reader is provided with an overview of recent developments in dynamical systems and can study the most progressive tendencies in this field of science.

Our experience shows that a broad thematic scope comprising dynamical systems encourages researchers to exchange their opinions on different branches of dynamics. We think that the vivid discussion will influence positively creativity and will result in effective solutions of many problems of dynamical systems in mechanics and physics, both in terms of theory and applications.

We do hope that DSTA 2019 will contribute to establishing new and tightening the already existing relations and scientific and technological cooperation between Polish and foreign institutions.

On behalf of both
Scientific and Organizing Committees

A handwritten signature in black ink, appearing to read 'Awrejcewicz', with a stylized flourish at the end.

Chairman
Professor Jan Awrejcewicz