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The 3rd International Workshop

Boundary Value Problems, Functional Equations and Applications

Rzeszów, Poland, April 20-23, 2016
Abstracts

University of Rzeszów

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Preface

Dear Colleagues,

Welcome to the University of Rzeszów and the 3rd International Workshop *Boundary Value Problems, Functional Equations and Applications* (BFA3). The meeting is devoted to recent research in the field of differential and functional equations, complex and real analysis, with a special emphasis on topics related to boundary value problems and their applications. The conference is included in the series of conferences associated with the International Society for Analysis, its Applications and Computation (ISAAC). The venue of the workshop is the University of Rzeszów which is the biggest academic institution in Podkarpackie voivodeship situated in southeastern Poland. Two previous editions of the workshop took place in Kraków, in 2008 and 2010.

This book contains the abstracts of scientific contributions of the participants of the 3rd International Workshop Boundary Value Problems, Functional Equations and Applications. We would like to thank all our dear colleagues who contributed with their presentations. Special thanks go to the plenary speakers: Professor Mirosław Lachowicz, Professor Mohamed M. S. Nasser, Professor Irena Rachůnková, Professor Alexander Soldatov and Professor Eugeniusz Szeregij.

We highly appreciate the financial support received from the **ISAAC**, **Eurotech** and **OPTeam**.

Our conference is also sponsored by:

- The Rector of the University of Rzeszów – Professor Sylwester Czopek,
- The Dean of the Faculty of Mathematics – Professor Ołeh Łopuszański,
- The Marshal of the Podkarpackie Voivodeship – Władysław Ortyl,
- The President of Rzeszów – Tadeusz Ferenc,
- Aviation Valley,
- TVP Rzeszów.

We believe that you will find the workshop a good opportunity for research, discussions and informal meetings.

Rzeszów, April 20, 2016

Piotr Drygaś
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Organization

The 3rd International Workshop Boundary Value Problems, Functional Equations and Applications (BFA3 2016) is organized by the Faculty of Mathematics and Natural Sciences, University of Rzeszów, Poland.

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Controllability of the process described by system of ODE with constraints

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In the article we present a method for solution of the controllability problem for process described by ordinary differential equations with boundary conditions, phase and integral restrictions. We developed an algorithm for solving the high-speed performance problem. General idea of the proposed method for solving the controllability problem is the possibility of reducing it to some class of Fredholm integral equation of the first kind. It is shown that the controllability problem for ordinary differential equations can be reduced to the corresponding initial optimal control problem.

As the part of the solving the optimal control problem we obtained necessary and sufficient conditions for the existing of the solution to this problem. The method of solving this problem uses constructing of minimizing sequences and it is designed for the computer application. We obtained estimation of the rate of convergence for minimizing sequences. An algorithm for solving the problem is formulated. Constructiveness of the method is illustrated with an example.

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