

## Preface

Óbuda University has an intensive research cooperation in engineering high tech fields including mechanical, electric and electronic engineering, materials science, robotics, optimal control and informatics. All these activities are related to or involve applied and industrial mathematics research as well. This volume is a selection of 12 papers that contain either new results in applied mathematics or use mathematics to solve an important application problem. Most of the papers are written by staff members of Óbuda University and/or their research partners from all over the world. The topics of presented results vary from graph theory to fuzzy decision making. The authors indeed use a wide spectrum of mathematical methods for their investigation. The first paper by T. K. Pogány is related to sampling of stochastic  $L^2$ -processes. The paper of J. Abaffy and A. Galántai gives a new method for global Lipschitz optimization and related numerical experiments. The third paper of this volume is written by R. Briggs and P. T. Nagy who derive a classification of sub-Riemannian manifolds and also give an application to an invariant optimal control problem. The paper of A. Baricz and T. K. Pogány presents monotonicity and convexity properties for the one dimensional regularization of the Coulomb potential and gives Turán type inequalities used in some applications. A. Kristály and S. Nagy investigate the existence of Stackelberg equilibrium in games defined on manifolds. The paper of J. Abaffy and S. Fodor presents a new method for solving mixed-integer problems by applying the ABS approach to Gomory's cutting plane algorithm.

Authors D. H. Hoang, M. Benes and T. Oberhuber develop a numerical simulation of anisotropic mean curvature of graphs in the context of relative geometry. T. Réti and D. Dimitrov's paper compares various irregularity measures for bidegreed graphs. The paper of D. L. Debeljovic, S. B. Stojanovic and A. M. Jovanovic gives a condition of algebraic character for the finite-time stability of linear time-delay systems, while the work of K. R. Hedrig and L. Veljovic gives a new description of kinetic pressures on shaft bearings of a rigid body nonlinear dynamics. The paper of C. O. Morariu and S-M. Zaharia suggest a new method for reliability testing. The work of P. Rezaei, K. Rezaie, S. Nazari-Shirkouhi and M- R- J. Tajabadi gives an interesting application of fuzzy decision making to allocate an underground dam to improve water management.

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