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Advances in Non-Integer Order Calculus and Its Applications

Proceedings of the 10th International Conference on Non-Integer Order Calculus and Its Applications
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Preface

Non-integer or fractional-order calculus is a generalization of classical one, and it has a long history. Its origin goes back more than three centuries, to the famous correspondence between Gottfried Leibnitz and Guillaume L’Hopital in 1695. However, only in the twentieth century, in June 1974, Bertram Ross organized the first conference dedicated to fractional calculus and its applications. Nowadays, fractional calculus is an important mathematical discipline that plays a fundamental role in the modeling of numerous phenomena in many fields of science and engineering.

This book is based on the 10th International Conference of Non-integer Order Calculus and its Applications that was held at the Bialystok University of Technology, Bialystok, Poland, September 20–21, 2018. The conference gathered researchers from several countries to discuss a very wide spectrum of problems in science and engineering. There were three plenary lectures, 48 communications and 10 posters on ongoing current research. The conference was a platform for exchanging recent developments, discoveries and progress on fractional calculus and its applications in all fundamental sciences and engineering.

This volume includes 22 original research papers that were selected among works presented at the 10th International Conference of Non-integer Order Calculus and its Applications. Each one of these papers has been carefully scrutinized, having passed the standard refereeing process. We would like to take this opportunity to thank again all the contributors and reviewers.

The post-conference monograph consists of four parts:

1. Mathematical Foundations,
2. Approximation, Modeling and Simulations,
3. Fractional Systems Analysis and Control,
4. Applications.

Fractional-order calculus is a very active and promising area of research. We hope that this post-conference monograph will motivate and encourage readers to follow the research activity in the subject. Maybe some of them will take part in the exploration of the theory and applications of non-integer order calculus.
The editors are grateful to all members of the Scientific Committee, the Organizing Committees and the Supporting Team. They deeply thank all attendees to the 10th International Conference of Non-integer Order Calculus and its Applications for their participation and inspiring lectures.

February 2019

Agnieszka B. Malinowska
Dorota Mozyrska
Łukasz Sajewski
The 10th International Conference of Non-integer Order Calculus and its Applications was organized by the Bialystok Branch of the Polish Mathematical Society in cooperation with the Faculty of Computer Science and the Faculty of Electrical Engineering of the Bialystok University of Technology.

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