Studies in Computational Intelligence

Volume 699

Series editor

Janusz Kacprzyk, Polish Academy of Sciences, Warsaw, Poland
e-mail: kacprzyk@ibspan.waw.pl

About this Series

The series "Studies in Computational Intelligence" (SCI) publishes new developments and advances in the various areas of computational intelligence—quickly and with a high quality. The intent is to cover the theory, applications, and design methods of computational intelligence, as embedded in the fields of engineering, computer science, physics and life sciences, as well as the methodologies behind them. The series contains monographs, lecture notes and edited volumes in computational intelligence spanning the areas of neural networks, connectionist systems, genetic algorithms, evolutionary computation, artificial intelligence, cellular automata, self-organizing systems, soft computing, fuzzy systems, and hybrid intelligent systems. Of particular value to both the contributors and the readership are the short publication timeframe and the worldwide distribution, which enable both wide and rapid dissemination of research output.

More information about this series at http://www.springer.com/series/7092

George A. Anastassiou

Intelligent Comparisons II: Operator Inequalities and Approximations

Springer

George A. Anastassiou
Department of Mathematical Sciences
University of Memphis
Memphis, TN
USA

ISSN 1860-949X ISSN 1860-9503 (electronic)
Studies in Computational Intelligence
ISBN 978-3-319-51474-1 ISBN 978-3-319-51475-8 (eBook)
DOI 10.1007/978-3-319-51475-8

Library of Congress Control Number: 2015944153

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

To My Family

Preface

This is a supplementary, complementary and companion brief monograph to the recently published monograph, by the same author, titled: "Intelligent Comparisons: Analytic Inequalities", Studies in Computational Intelligence 609, Springer Heidelberg/New York, 2016. It is the analog of the last one, regarding self-adjoint operator well-known inequalities and approximation theory of Korovkin type both in a Hilbert space environment. These are studied for the first time in the literature, and chapters are self-contained and can be read independently. This concise monograph is suitable to be used in related graduate classes and research projects.

The list of presented topics follows:

Self-adjoint operator Korovkin-type quantitative approximations.
Self-adjoint operator Korovkin type and polynomial direct approximations with rates.
Quantitative self-adjoint operator other direct approximations.
Fractional self-adjoint operator Poincaré- and Sobolev-type inequalities.
Self-adjoint operator Ostrowski-type inequalities.
Integer and fractional self-adjoint operator Opial-type inequalities.
Self-adjoint operator Chebyshev–Grüss-type inequalities.
Most general fractional self-adjoint operator representation formulae and operator Poincaré and Sobolev types and other basic inequalities.
Self-adjoint operator harmonic Chebyshev–Grüss inequalities.
Most general self-adjoint operator Chebyshev–Grüss inequalities.
A fractional means inequality.
An extensive list of references is given per chapter.

This book's results are expected to find applications in many areas of pure and applied mathematics. As such this monograph is suitable for researchers, graduate students, and seminars of the above disciplines, also to be in all science and engineering libraries.

The preparation of this book took place during 2016 in Memphis.

The author likes to thank Prof. Alina Lupas of University of Oradea, Romania, for checking and reading the manuscript.

Memphis, TN, USA George A. Anastassiou
November 2016

Contents

Author Biography

George A. Anastassiou was born in Athens, Greece in 1952. He received his B.SC degree in Mathematics from Athens University, Greece in 1975. He received his Diploma in Operations Research from Southampton University, UK in 1976. He also received his MA in Mathematics from University of Rochester, USA in 1981. He was awarded his Ph. D in Mathematics from University of Rochester, USA in 1984. During 1984-86 he served as a visiting assistant professor at the University of Rhode Island, USA.

Since 1986 till now 2016, he is a faculty member at the University of Memphis, USA. He is currently a full Professor of Mathematics since 1994. His research area

is “Computational Analysis” in the very broad sense. He has published over 426 research articles in international mathematical journals and 36 monographs, proceedings and textbooks in well-known publishing houses. Several awards have been awarded to George Anastassiou. In 2007 he received the Honorary Doctoral Degree from University of Oradea, Romania. He is associate editor in over 60 international mathematical journals and editor in-chief in 3 journals, most notably in the well-known “Journal of Computational Analysis and Applications”.