

Series on Concrete and Applicable Mathematics – Vol.17

Frontiers in Time Scales and Inequalities

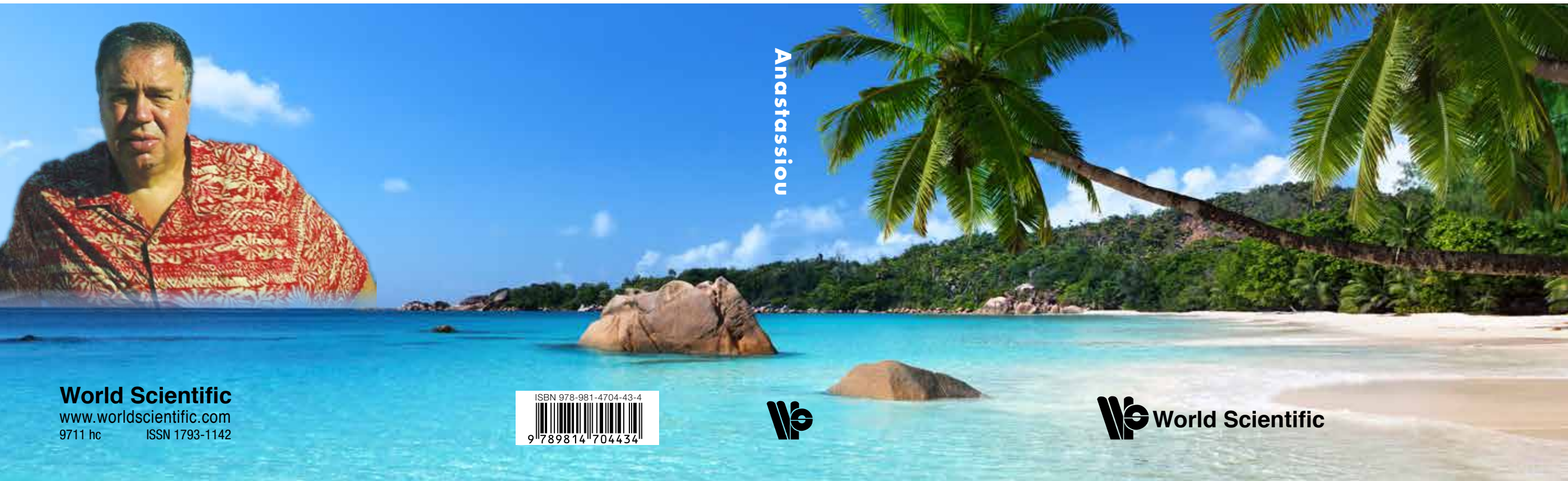
This monograph contains the author's work of the last four years in discrete and fractional analysis. We introduce the right delta and right nabla fractional calculus on time scales. We continue with the right delta and right nabla discrete fractional calculus in the Caputo sense. Then, we give representation formulae of functions on time scales and we present Ostrowski type inequalities, Landau type inequalities, Gruss type and comparison of means inequalities, all these over the time scales. We continue with integral operator inequalities and their multivariate vectorial versions using convexity of functions, again all these over time scales. It follows the Gruss and Ostrowski type inequalities involving s -convexity of functions; we examine also the general case when we involve several functions. Then, we present general fractional Hermite–Hadamard type inequalities using m -convexity and (s, m) -convexity. Finally, we introduce the reduction method in fractional calculus and study its connection to fractional Ostrowski type inequalities.

This book's results are expected to find applications in many areas of pure and applied mathematics, especially in difference equations and fractional differential equations. The chapters are self-contained and can be read independently, and advanced courses can be taught out of it. It is suitable for researchers, graduate students, and seminars of the above subjects. It serves well as an invaluable resource for all science libraries.

Frontiers in Time Scales and Inequalities

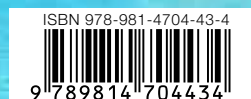
George Anastassiou

Frontiers in Time Scales and Inequalities



Anastassiou

World Scientific
www.worldscientific.com
9711 hc ISSN 1793-1142



World Scientific

Series on Concrete and Applicable Mathematics – Vol.17

Frontiers in Time Scales and Inequalities

This monograph contains the author's work of the last four years in discrete and fractional analysis. We introduce the right delta and right nabla fractional calculus on time scales. We continue with the right delta and right nabla discrete fractional calculus in the Caputo sense. Then, we give representation formulae of functions on time scales and we present Ostrowski type inequalities, Landau type inequalities, Gruss type and comparison of means inequalities, all these over the time scales. We continue with integral operator inequalities and their multivariate vectorial versions using convexity of functions, again all these over time scales. It follows the Gruss and Ostrowski type inequalities involving s -convexity of functions; we examine also the general case when we involve several functions. Then, we present general fractional Hermite–Hadamard type inequalities using m -convexity and (s, m) -convexity. Finally, we introduce the reduction method in fractional calculus and study its connection to fractional Ostrowski type inequalities.

This book's results are expected to find applications in many areas of pure and applied mathematics, especially in difference equations and fractional differential equations. The chapters are self-contained and can be read independently, and advanced courses can be taught out of it. It is suitable for researchers, graduate students, and seminars of the above subjects. It serves well as an invaluable resource for all science libraries.

Frontiers in Time Scales and Inequalities

George Anastassiou

Frontiers in Time Scales and Inequalities

Anastassiou

World Scientific
www.worldscientific.com
9711 hc ISSN 1793-1142



World Scientific

Springer Undergraduate Texts
in Mathematics and Technology

SUMAT

George A. Anastassiou
Razvan A. Mezei

Numerical Analysis Using Sage

EXTRA
MATERIALS
springerlink.com

 Springer

Numerical Analysis Using Sage

This is the first numerical analysis text to use Sage for the implementation of algorithms and can be used in a one-semester course for undergraduates in mathematics, math education, computer science/information technology, engineering, and physical sciences. The primary aim of this text is to simplify understanding of the theories and ideas from a numerical analysis/numerical methods course via a modern programming language like Sage. Aside from the presentation of fundamental theoretical notions of numerical analysis throughout the text, each chapter concludes with several exercises that are oriented to real-world application. Answers may be verified using Sage.

The presented code, written in core components of Sage, are backward compatible, i.e., easily applicable to other software systems such as *Mathematica*®. Sage is open source software and uses Python-like syntax. Previous Python programming experience is not a requirement for the reader, though familiarity with any programming language is a plus. Moreover, the code can be written using any web browser and is therefore useful with laptops, tablets, iPhones, smartphones, etc. All Sage code that is presented in the text is freely available on the Springerlink website.

Mathematics

ISBN 978-3-319-16738-1



EXTRA
MATERIALS
springerlink.com

► springer.com

George Anastassiou

Frontiers in Approximation Theory

Frontiers in Approximation Theory

Series on Concrete and Applicable Mathematics – Vol.16

Frontiers in Approximation Theory

This monograph presents the author's work of the last five years in approximation theory. The chapters are self-contained and can be read independently. Readers will find the topics covered are diverse and advanced courses can be taught out of this book.

The first part of the book is dedicated to fractional monotone approximation theory introduced for the first time by the author, taking the related ordinary theory of usual differentiation at the fractional differentiation level having polynomials and splines as approximators. Very little is written so far about fractional approximation theory which is at its infancy. The second part deals with the approximation by discrete singular operators of the Favard style, for example, of the Picard and Gauss-Weierstrass types. Then, it continues in a very detailed and extensive chapter on approximation by interpolating operators induced by neural networks, a connection to computer science. This book ends with the approximation theory and functional analysis on time scales, a very modern topic, detailing all the pros and cons of this method.

The results found in this book are expected to find applications in many areas of pure and applied mathematics. As such, it is suitable for researchers, graduate students, and seminars as well as an invaluable resource for all science libraries.



World Scientific
www.worldscientific.com
9649 hc ISSN 1793-1142

ISBN 978-981-4696-08-1
9 789814 696081



World Scientific

George Anastassiou

Frontiers in Approximation Theory

Frontiers in Approximation Theory

Series on Concrete and Applicable Mathematics – Vol.16

Frontiers in Approximation Theory

This monograph presents the author's work of the last five years in approximation theory. The chapters are self-contained and can be read independently. Readers will find the topics covered are diverse and advanced courses can be taught out of this book.

The first part of the book is dedicated to fractional monotone approximation theory introduced for the first time by the author, taking the related ordinary theory of usual differentiation at the fractional differentiation level having polynomials and splines as approximators. Very little is written so far about fractional approximation theory which is at its infancy. The second part deals with the approximation by discrete singular operators of the Favard style, for example, of the Picard and Gauss-Weierstrass types. Then, it continues in a very detailed and extensive chapter on approximation by interpolating operators induced by neural networks, a connection to computer science. This book ends with the approximation theory and functional analysis on time scales, a very modern topic, detailing all the pros and cons of this method.

The results found in this book are expected to find applications in many areas of pure and applied mathematics. As such, it is suitable for researchers, graduate students, and seminars as well as an invaluable resource for all science libraries.



Anastassiou

World Scientific
www.worldscientific.com
9649 hc ISSN 1793-1142



World Scientific

Series on Concrete and Applicable Mathematics – Vol.16

Frontiers in Approximation Theory

This monograph presents the author's work of the last five years in approximation theory. The chapters are self-contained and can be read independently. Readers will find the topics covered are diverse and advanced courses can be taught out of this book.

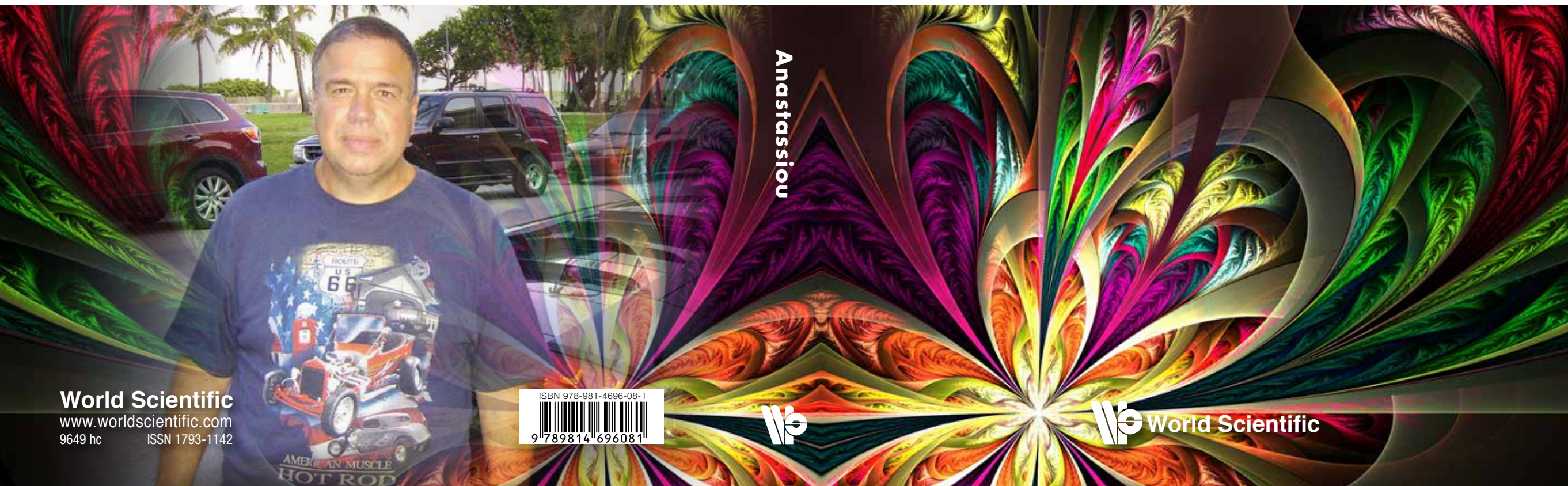
The first part of the book is dedicated to fractional monotone approximation theory introduced for the first time by the author, taking the related ordinary theory of usual differentiation at the fractional differentiation level having polynomials and splines as approximators. Very little is written so far about fractional approximation theory which is at its infancy. The second part deals with the approximation by discrete singular operators of the Favard style, for example, of the Picard and Gauss-Weierstrass types. Then, it continues in a very detailed and extensive chapter on approximation by interpolating operators induced by neural networks, a connection to computer science. This book ends with the approximation theory and functional analysis on time scales, a very modern topic, detailing all the pros and cons of this method.

The results found in this book are expected to find applications in many areas of pure and applied mathematics. As such, it is suitable for researchers, graduate students, and seminars as well as an invaluable resource for all science libraries.

Frontiers in Approximation Theory

George Anastassiou

Frontiers in Approximation Theory



World Scientific
www.worldscientific.com
9649 hc ISSN 1793-1142



World Scientific

Studies in Computational Intelligence 609

George A. Anastassiou

Intelligent Comparisons: Analytic Inequalities

This monograph presents recent and original work of the author on inequalities in real, functional and fractional analysis. The chapters are self-contained and can be read independently, they include an extensive list of references per chapter.

The book's results are expected to find applications in many areas of applied and pure mathematics, especially in ordinary and partial differential equations and fractional differential equations. As such this monograph is suitable for researchers, graduate students, and seminars of the above subjects, as well as Science and Engineering University libraries.

609
Anastassiou

Studies in Computational Intelligence 609

George A. Anastassiou



Intelligent Comparisons:
Analytic Inequalities

Intelligent Comparisons: Analytic Inequalities

Engineering
ISSN 1860-949X

ISBN 978-3-319-21120-6



► springer.com

 Springer

Intelligent Comparisons: Analytic Inequalities

Authors: **Anastassiou**, George A.

- [Presents recent research on inequalities in real, functional and fractional analysis](#)

Buy this book

eBook\$179.00

price for USA [change](#)

- 
- ISBN 978-3-319-21121-3
 - digitally watermarked, no DRM
 - included format: EPUB, PDF
 - eBooks can be used on all Reading Devices
 - download immediately after purchase

Hardcover\$229.00

[FAQ Policy](#)

[see more benefits](#)

- [About this book](#)

This monograph presents recent and original work of the author on inequalities in real, functional and fractional analysis. The chapters are self-contained and can be read independently, they include an extensive list of references per chapter.

The book's results are expected to find applications in many areas of applied and pure mathematics, especially in ordinary and partial differential equations and fractional differential equations. As such this monograph is suitable for researchers, graduate students, and seminars of the above subjects, as well as Science and Engineering University libraries.

[Show all](#)

Table of contents (27 chapter)

- [Fractional Polya Integral Inequality](#)
Anastassiou, George A.

Pages 1-7

[Preview](#)  \$29.95

- [Univariate Fractional Polya Integral Inequalities](#)
Anastassiou, George A.

	Pages 9-21
• About Multivariate General Fractional Polya Integral Inequalities Anastassiou, George A.	Pages 23-55
• Balanced Canavati Fractional Opial Inequalities Anastassiou, George A.	Pages 57-66
• Fractional Representation Formulae Using Initial Conditions and Fractional Ostrowski Inequalities Anastassiou, George A.	Pages 67-94
• Basic Fractional Integral Inequalities Anastassiou, George A.	Pages 95-130
• Harmonic Multivariate Ostrowski and Grüss Inequalities Using Several Functions Anastassiou, George A.	Pages 131-158
• Fractional Ostrowski and Grüss Inequalities Using Several Functions Anastassiou, George A.	Pages 159-173
• Further Interpretation of Some Fractional Ostrowski and Grüss Type Inequalities Anastassiou, George A.	Pages 175-187
• Multivariate Fractional Representation Formula and Ostrowski Inequality Anastassiou, George A.	Pages 189-198
• Multivariate Weighted Fractional Representation Formulae and Ostrowski Inequalities Anastassiou, George A.	Pages 199-207
• About Multivariate Lyapunov Inequalities Anastassiou, George A.	Pages 209-216
• Ostrowski Type Inequalities for Semigroups Anastassiou, George A.	Pages 217-230
• About Ostrowski Inequalities for Cosine and Sine Operator Functions Anastassiou, George A.	Pages 231-244
• About Hilbert-Pachpatte Inequalities for Semigroups, Cosine and Sine Operator Functions Anastassiou, George A.	Pages 245-258
• About Ostrowski and Landau Type Inequalities for Banach Space Valued Functions Anastassiou, George A.	Pages 259-289
• Multidimensional Ostrowski Type Inequalities for Banach Space Valued Functions Anastassiou, George A.	Pages 291-340
• About Fractional Representation Formulae and Right Fractional Inequalities Anastassiou, George A.	Pages 341-369

- [About Canavati Fractional Ostrowski Inequalities](#)
Anastassiou, George A. Pages 371-390
- [The Most General Fractional Representation Formula for Functions and Consequences](#)
Anastassiou, George A. Pages 391-399
- [Rational Inequalities for Integral Operators Using Convexity](#)
Anastassiou, George A. Pages 401-438
- [Fractional Integral Inequalities with Convexity](#)
Anastassiou, George A. Pages 439-475
- [Vectorial Inequalities for Integral Operators Involving Ratios of Functions Using Convexity](#)
Anastassiou, George A. Pages 477-513
- [About Vectorial Splitting Rational](#)
Anastassiou, George A. Pages 515-548
- [About Separating Rational](#)
Anastassiou, George A. Pages 549-583
- [About Vectorial Hardy Type Fractional Inequalities](#)
Anastassiou, George A. Pages 585-622
- [About Vectorial Fractional Integral Inequalities Using Convexity](#)
Anastassiou, George A. Pages 623-659

[Read this book on SpringerLink](#)

- [Download Preface 1 PDF](#) (49.3 KB)
- [Download Sample pages 2 PDF](#) (166.8 KB)
- [Download Table of contents PDF](#) (141.5 KB)

Studies in Computational Intelligence 608

George A. Anastassiou

Intelligent Systems II: Complete Approximation by Neural Network Operators

 Springer

George A. Anastassiou

Intelligent Systems II: Complete Approximation by Neural Network Operators

This monograph is the continuation and completion of the monograph, "Intelligent Systems: Approximation by Artificial Neural Networks" written by the same author and published 2011 by Springer.

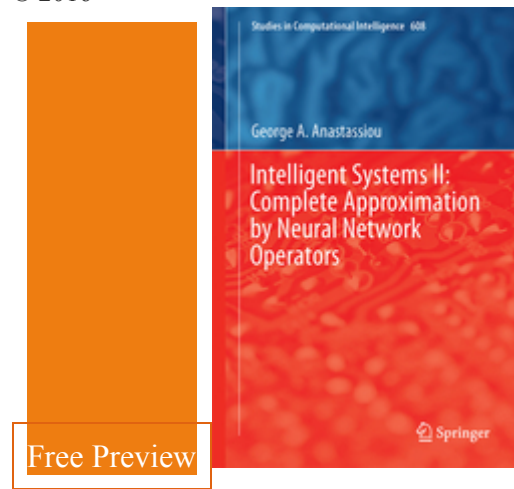
The book you hold in hand presents the complete recent and original work of the author in approximation by neural networks. Chapters are written in a self-contained style and can be read independently. Advanced courses and seminars can be taught out of this brief book. All necessary background and motivations are given per chapter. A related list of references is given also per chapter. The book's results are expected to find applications in many areas of applied mathematics, computer science and engineering. As such this monograph is suitable for researchers, graduate students, and seminars of the above subjects, also for all science and engineering libraries.

Engineering
ISSN 1860-949X

ISBN 978-3-319-20504-5



► springer.com



Intelligent Systems II: Complete Approximation by Neural Network Operators

Authors: **Anastassiou**, George A.

- Continuation and completion of the author's earlier 2011 monograph, "Intelligent Systems: Approximation by Artificial Neural Networks", 712 PAGES, SPRINGER, \$230.

36

Chapter downloads/week on SpringerLink

- [About this book](#)

This monograph is the continuation and completion of the monograph, "Intelligent Systems: Approximation by Artificial Neural Networks" written by the same author and published 2011 by Springer.

The book you hold in hand presents the complete recent and original work of the author in approximation by neural networks. Chapters are written in a self-contained style and can be read independently. Advanced courses and seminars can be taught out of this book. All necessary background and motivations are given per chapter. A related list of references is given also per chapter. The book's results are expected to find applications in many areas of applied mathematics, computer science and engineering. As such this monograph is suitable for researchers, graduate students, and seminars of the above subjects, also for all science and engineering libraries.

[Show all](#)

Table of contents (28 chapters)

- [Rate of Convergence of Basic Neural Network Operators to the Unit-Univariate Case](#)

Anastassiou, George A.

Pages 1-9

[Preview](#) \$29.95

-
- [Rate of Convergence of Basic Multivariate Neural Network Operators to the Unit](#)
Anastassiou, George A.
Pages 11-21
 - [Fractional Neural Network Operators Approximation](#)
Anastassiou, George A.
Pages 23-58
 - [Fractional Approximation Using Cardaliaguet-Euvrard and Squashing Neural Networks](#)
Anastassiou, George A.
Pages 59-87
 - [Fractional Voronovskaya Type Asymptotic Expansions for Quasi-interpolation Neural Networks](#)
Anastassiou, George A.
Pages 89-101
 - [Voronovskaya Type Asymptotic Expansions for Multivariate Quasi-interpolation Neural Networks](#)
Anastassiou, George A.
Pages 103-118
 - [Fractional Approximation by Normalized Bell and Squashing Type Neural Networks](#)
Anastassiou, George A.
Pages 119-141
 - [Fractional Voronovskaya Type Asymptotic Expansions for Bell and Squashing Type Neural Networks](#)
Anastassiou, George A.
Pages 143-152
 - [Multivariate Voronovskaya Type Asymptotic Expansions for Normalized Bell and Squashing Type Neural Networks](#)
Anastassiou, George A.
Pages 153-163
 - [Multivariate Fuzzy-Random Normalized Neural Network Approximation](#)
Anastassiou, George A.
Pages 165-191
 - [Fuzzy Fractional Approximations by Fuzzy Normalized Bell and Squashing Type Neural Networks](#)
Anastassiou, George A.
Pages 193-214
 - [Fuzzy Fractional Neural Network Approximation Using Fuzzy Quasi-interpolation Operators](#)
Anastassiou, George A.
Pages 215-249
 - [Higher Order Multivariate Fuzzy Approximation Using Basic Neural Network Operators](#)
Anastassiou, George A.
Pages 251-266
 - [High Order Multivariate Fuzzy Approximation Using Quasi-interpolation Neural Networks](#)
Anastassiou, George A.
Pages 267-297
 - [Multivariate Fuzzy-Random Quasi-interpolation Neural Networks Approximation](#)
Anastassiou, George A.
Pages 299-320
 - [Approximation by Kantorovich and Quadrature Type Quasi-interpolation Neural Networks](#)
Anastassiou, George A.
Pages 321-330

- [Univariate Error Function Based Neural Network Approximations](#)
Anastassiou, George A. Pages 331-373
 - [Multivariate Error Function Based Neural Network Operators Approximation](#)
Anastassiou, George A. Pages 375-407
 - [Voronovskaya Type Asymptotic Expansions for Error Function Based Quasi-interpolation Neural Networks](#)
Anastassiou, George A. Pages 409-430
 - [Fuzzy Fractional Error Function Relied Neural Network Approximations](#)
Anastassiou, George A. Pages 431-463
 - [High Degree Multivariate Fuzzy Approximation by Neural Network Operators Using the Error Function](#)
Anastassiou, George A. Pages 465-496
 - [Multivariate Fuzzy-Random Error Function Relied Neural Network Approximations](#)
Anastassiou, George A. Pages 497-521
 - [Approximation by Perturbed Neural Networks](#)
Anastassiou, George A. Pages 523-551
 - [Approximations by Multivariate Perturbed Neural Networks](#)
Anastassiou, George A. Pages 553-585
 - [Voronovskaya Type Asymptotic Expansions for Perturbed Neural Networks](#)
Anastassiou, George A. Pages 587-626
- [Show next 3](#)

Read this book on SpringerLink

- [Download Preface 1 PDF](#) (44.3 KB)
- [Download Sample pages 2 PDF](#) (143.4 KB)
- [Download Table of contents PDF](#) (174.6 KB)

- Approximation Using Fuzzy Perturbed Neural Networks

Anastassiou, George A.

Pages 627-654

- Multivariate Fuzzy Perturbed Neural Network Approximations

Anastassiou, George A.

Pages 655-686

- Multivariate Fuzzy-Random Perturbed Neural Network Approximations

Anastassiou, George A.

Pages 687-710