

Studies in Systems, Decision and Control 130

George A. Anastassiou · Ioannis K. Argyros

## Functional Numerical Methods: Applications to Abstract Fractional Calculus

This book presents applications of Newton-like and other similar methods to solve abstract functional equations involving fractional derivatives. It focuses on Banach space-valued functions of a real domain – studied for the first time in the literature. Various issues related to the modeling and analysis of fractional order systems continue to grow in popularity, and the book provides a deeper and more formal analysis of selected issues that are relevant to many areas – including decision-making, complex processes, systems modeling and control – and deeply embedded in the fields of engineering, computer science, physics, economics, and the social and life sciences. The book offers a valuable resource for researchers and graduate students, and can also be used as a textbook for seminars on the above-mentioned subjects. All chapters are self-contained and can be read independently. Further, each includes an extensive list of references.

Engineering

ISBN 978-3-319-69525-9



▶ [springer.com](http://springer.com)

Anastassiou · Argyros



Functional Numerical Methods:  
Applications to Abstract Fractional Calculus

Studies in Systems, Decision and Control 130

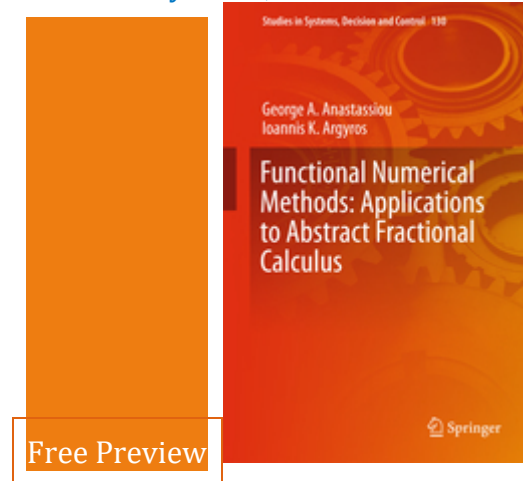
George A. Anastassiou  
Ioannis K. Argyros

# Functional Numerical Methods: Applications to Abstract Fractional Calculus

 Springer

[Engineering Computational Intelligence and Complexity](#)

[Studies in Systems, Decision and Control](#) SPRINGER



© 2018

# Functional Numerical Methods: Applications to Abstract Fractional Calculus

Authors: **Anastassiou**, George A., **Argyros**, Ioannis K.

- Presents applications of Newton-like and other similar methods for solving abstract functional equations involving abstract Caputo and Canavati-type fractional derivatives

[see more benefits](#)

- [About this book](#)

This book presents applications of Newton-like and other similar methods to solve abstract functional equations involving fractional derivatives. It focuses on Banach space-valued functions of a real domain – studied for the first time in the literature. Various issues related to the modeling and analysis of fractional order systems continue to grow in popularity, and the book provides a deeper and more formal analysis of selected issues that are relevant to many areas – including decision-making, complex processes, systems modeling and control – and deeply embedded in the fields of engineering, computer science, physics, economics, and the social and life sciences. The book offers a valuable resource for researchers and graduate students, and can also be used as a textbook for seminars on the above-mentioned subjects. All chapters are self-contained and can be read independently. Further, each chapter includes an extensive list of references.

[Table of contents \(10 chapters\)](#)

- [Explicit-Implicit Methods with Applications to Banach Space Valued Functions in Abstract Fractional Calculus](#)  
 Anastassiou, George A. (et al.) Pages 1-19

[Preview](#) [Buy Chapter](#) \$29.95

---
- [Convergence of Iterative Methods in Abstract Fractional Calculus](#)  
 Anastassiou, George A. (et al.) Pages 21-39
- [Equations for Banach Space Valued Functions in Fractional Vector Calculi](#)  
 Anastassiou, George A. (et al.) Pages 41-57
- [Iterative Methods in Abstract Fractional Calculus](#)  
 Anastassiou, George A. (et al.) Pages 59-72
- [Semi-local Convergence in Right Abstract Fractional Calculus](#)  
 Anastassiou, George A. (et al.) Pages 73-86
- [Algorithmic Convergence in Abstract g-Fractional Calculus](#)  
 Anastassiou, George A. (et al.) Pages 87-104
- [Iterative Procedures for Solving Equations in Abstract Fractional Calculus](#)  
 Anastassiou, George A. (et al.) Pages 105-120
- [Approximate Solutions of Equations in Abstract g-Fractional Calculus](#)  
 Anastassiou, George A. (et al.) Pages 121-137
- [Generating Sequences for Solving in Abstract g-Fractional Calculus](#)  
 Anastassiou, George A. (et al.) Pages 139-153
- [Numerical Optimization and Fractional Invexity](#)  
 Anastassiou, George A. (et al.) Pages 155-161

## Buy this book

---

**eBook\$74.99**

price for USA (gross)  
valid through November 5, 2017

[Buy eBook](#)

- ISBN 978-3-319-69526-6
  - Digitally watermarked, DRM-free
  - Included format: EPUB, PDF
  - ebooks can be used on all reading devices
  - Immediate eBook download after purchase
- 

**Hardcover\$99.00**