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Nota di contenuto	Cover -- HalfTitle Page -- Title Page -- Copyright Page -- Declaration -- Declaration -- About the Editor -- Table of Contents -- List of Contributors -- List of Abbreviations -- Preface -- Chapter 1: Introduction -- Key Methods in Functional Calculus -- Applications and Future Directions of Functional Calculus -- References -- Chapter 2: Centrality and Shortest Path Length Measures for the Functional Analysis of Urban Drainage Networks -- Abstract -- Introduction -- Materials and Methods -- Results and Discussion -- Summary and Conclusions -- Supplementary Information -- Abbreviations -- Acknowledgements -- Authors' Contributions -- Funding -- References -- Chapter 3: Metasurface Holographic Image Projection Based on Mathematical Properties of Fourier Transform -- Abstract -- Introduction -- Methods -- Results and Discussion -- Conclusions -- Supplementary Information -- References -- Authors' Contributions -- Funding -- Competing Interests -- References -- Chapter 4: Fractional-Calculus-Based Control Scheme for Dynamical Systems With Input Uncertainty -- Abstract -- Introduction -- Fractional-calculus Preliminaries -- System Description and Problem Statement -- Design of Fractional Sliding Active Control Scheme -- Computer Simulations -- Conclusions -- References -- Chapter 5: Reservoir Reliability as Affected by Climate Change and Strategies for Adaptation -- Abstract

-- Introduction -- Materials and Methods -- Results -- Discussion -- Conclusions -- Author Contributions -- Acknowledgments -- References -- Chapter 6: A Shotgun Approach to Explore the Bacterial Diversity and a Brief Insight into the Glycoside Hydrolases of Samiti Lake -- Abstract -- Background -- Materials and Method -- Results -- Discussion -- Conclusion -- Abbreviations -- Acknowledgements -- Authors' Contributions -- Funding -- References.

Chapter 7: In Silico Comparative Structural and Functional analysis of Arsenite Methyltransferase from Bacteria, Fungi, Fishes, B -- Background -- Materials and Methods -- Result -- Discussion -- Conclusion -- Abbreviations -- Acknowledgements -- Authors' Contributions -- References -- Chapter 8: Rice Improvement Through Genome-Based Functional Analysis and Molecular Breeding in India -- Abstract -- Introduction -- Review -- Conclusions -- Acknowledgements -- Authors' Contributions -- References -- Chapter 9: Network and Functional Analyses of Differentially Expressed Genes in Gastric Cancer Provide New Biomarkers Associated -- Abstract -- Background -- Results -- Discussion -- Conclusion -- Methods -- Abbreviations -- References -- Chapter 10: An Image Segmentation Method Based on Improved Regularized Level Set Model -- Abstract -- Introduction -- Related Work -- Proposed Method -- Experimental Results -- Conclusion -- Author Contributions -- Funding -- References -- Chapter 11: Reinforcement Learning-Aided Channel Estimator in Time-Varying MIMO Systems -- Abstract -- Introduction -- Preliminaries -- Proposed Optimal Policy -- Further Performance Improvement -- Simulation Results -- Conclusions -- Author Contributions -- Funding -- References -- Chapter 12: A Computational Approach to Hand Pose Recognition in Early Modern Paintings -- Abstract -- Introduction -- Materials and Methods -- Results -- Discussion -- Author Contributions -- Acknowledgments -- References -- Chapter 13: Fog Computing Network Security Based on Resources Management -- Abstract -- Introduction -- Related Work -- Proposed Access Control Scheme -- Performance Evaluation -- Conclusion -- Methods/experimental -- Abbreviations -- Acknowledgments -- Author Contributions -- Funding -- References -- Chapter 14: Calculus of Variations on Time Scales: Applications to Economic Models. Abstract -- Introduction -- Time Scales -- The 'cake-eating' Problem -- The Household Problem -- Conclusions -- Acknowledgements -- Authors' Contributions -- References -- Chapter 15: Local Fractional System for Economic Order Quantity Using Entropy Solution -- Abstract -- Introduction -- Processing -- Results -- Examples -- Discussion -- Acknowledgements -- Authors' Contributions -- References -- Chapter 16: A New Model of Economic Order Quantity Associated with a Generalized Conformable Differential-Difference Operator -- Abstract -- Introduction -- Preparing -- Results -- Acknowledgements -- Authors' Contributions -- Funding -- References -- Index -- Backcover.

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## Sommario/riassunto

This book explores the principles, applications, and future prospects of functional calculus, a mathematical framework extending traditional calculus to functions of operators and complex entities. It is a comprehensive resource for students, researchers, and practitioners with a foundational understanding of calculus, interested in its applications across various fields. Functional calculus is applied in physics, engineering, biology, medical sciences, data science, machine learning, and artificial intelligence, providing tools for modeling, optimization, and innovation within complex systems. The book covers dynamic systems, quantum mechanics, signal processing, gene

expression, and data analysis, highlighting the relevance of functional calculus in solving contemporary challenges. It also discusses the integration of functional analysis with computational methods, offering insights into potential discoveries and innovations.

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