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Special Issue on

Innovations in Computational and Nonlinear Mathematics (Part-A)

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FOREWORD

In this special issue, titled "*Innovations in Computational and Nonlinear Mathematics*", we explore the intricate relationship between mathematical concepts and their numerous practical applications across various scientific fields, including nonlinear analysis and modeling, nonlinear dynamics and modern applications, and computational nonlinear mathematics. A variety of mathematical fields are represented here, each adding its thread to the vast fabric of human understanding and creativity.

The core of this issue is numerical analysis, differential equations, and optimization, which explores the complexities of numerical methods, solutions to differential equations, and optimization approaches essential for solving real-world problems. Next, we delve into the theoretical and practical implications of mathematical structures by exploring their foundations with real, functional, and complex analysis.

The exquisite qualities of algebraic structures, topological spaces, and geometric principles are unveiled in talks on algebra, topology, and geometry, which expand the mathematical landscape. In this spotlight, we explore computational tools and their practical applications in various mathematical domains. This area of study is known as applied and computational mathematics.

A special section explores the new field of fractional differential equations, examining the underlying theory and its practical applications that have made it a significant component of modern mathematical research. The versatility of fuzzy logic is demonstrated in Fuzzy Logic and its Applications, which explores the realm of uncertainty and decision-making.

With an emphasis on building meaningful models and traversing the domain of probability, mathematical modeling and probability theory emerge as crucial contributors to comprehending complex systems. Following this, we explore the State-of-the-Art of Mathematical Applications, where experts in the field share the most recent developments that are changing the face of engineering and science.

Applied mathematics and number theory connect theoretical insights with practical applications, whereas mathematical models and applications demonstrate the plasticity of mathematical constructs in solving real-world problems. Data representation and network analysis are at the heart of what is known as "information theory" and "signal processing," the two fields that converge to shed light on technological communication.

Returning to the very foundations of mathematical analysis, we delve into the basics of functions and equations. Information and graph theory are discussed in the issue's final section, highlighting their crucial roles in data representation and the analysis of complex networks.

We would like to extend our heartfelt gratitude to all the authors for their thoughtful contributions which have helped enhance our understanding of mathematics and its practical applications. As this special issue demonstrates, mathematics has always been crucial in pushing the boundaries of what is possible in the fields of Mathematical Science and its Applications.

The guest editors of this special issue would like to express their gratitude to the publishers Taru Publications, New Delhi, for their approval regarding the special issue of the esteemed *Journal of Interdesciplinary Mathematics*. Guest editors especially thank Prof. B. K. Dass, Chief Editor, who supported us in bringing out this special issue.

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