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Editorial
Fuzzy Calculus Theory and Its Applications

Omar Abu Arqub [ID],[1] **Carla Pinto,**[2] **Rosana Rodríguez López,**[3] **and Vedat Suat Ertürk**[4]

[1]*Al-Balqa' Applied University, Al-Salt, Jordan*
[2]*Polytechnic Institute of Porto, Porto, Portugal*
[3]*University of Santiago de Compostela, Santiago, Spain*
[4]*Ondokuz Mayıs University, Samsun, Turkey*

Correspondence should be addressed to Omar Abu Arqub; o.abuarqub@bau.edu.jo

Fuzzy calculus is the study of theory and applications of integrals and derivatives of uncertain functions. This branch of mathematical analysis, extensively investigated in recent years, has emerged as an effective and powerful tool for the mathematical modeling of several engineering and scientific phenomena.

Based on the wide applications in engineering and sciences such as physics, mechanics, chemistry, and biology, research on fuzzy ordinary and partial differential equations and other relative topics is active and extensive around the world. In the past few years, the growth of the subject is manifested by hundreds of research papers, several monographs, and many international conferences.

This special issue contains 8 papers, the contents of which are summarized as follows.

The paper "Fuzzy Fixed Point Results For Φ Contractive Mapping with Applications" by H. Humaira et al. establishes common fuzzy fixed point results for Φ contractive mappings involving control functions as coefficients of contractions in the setting of complex-valued metric space by using rational type contractions.

The paper "On Fuzzy Portfolio Selection Problems: A Parametric Representation Approach" by O. S. Fard and M. Ramezanzadeh investigates the constrained fuzzy-valued optimization problems with regard to the features of the parametric representation of fuzzy numbers.

In "Parameter Optimization of MIMO Fuzzy Optimal Model Predictive Control By APSO," A. Taieb et al introduce a new development for designing a multi-input multioutput fuzzy optimal model predictive control using the adaptive particle swarm optimization algorithm.

In "The Karush-Kuhn-Tucker Optimality Conditions for the Fuzzy Optimization Problems in the Quotient Space of Fuzzy Numbers," N. Yu and D. Qiu propose the solution concepts for the fuzzy optimization problems in the quotient space of fuzzy numbers.

In "Random Fuzzy Differential Equations with Impulses" by H. Vu, the random fuzzy differential equations (RFDEs) with impulses are considered. Using Picard method of successive approximations, the existence and uniqueness of solutions under suitable conditions are proved and some properties of solution are studied.

The paper "Methods in Ranking Fuzzy Numbers: A Unified Index and Comparative Reviews" by T.-L. Nguyen proposes a unified index that multiplies weighted-mean and weighted-area discriminatory components of a fuzzy number, respectively, called centroid value and attitude-incorporated left-and-right area.

In "The Portfolio Balanced Risk Index Model and Analysis of Examples of Large-Scale Infrastructure Project," W. Gao and K. Hong focus on a three-dimensional portfolio balanced risk index model for large-scale infrastructure project risk evaluation. Taking subjectivity utility and complex evaluation motivation into consideration, a method of combinational equilibrium evaluation is built using the index form to reflect whole loss changes of risk.

The paper "Different solution strategy for solving epidemic model in imprecise Environment" by A. Mahata

et al. discusses the different solution strategy for solving epidemic model in different imprecise environment, that is, a susceptible-infected-susceptible model in imprecise environment.
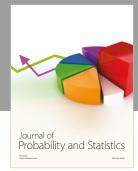
Omar Abu Arqub
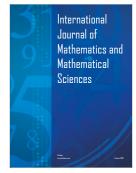*Carla Pinto*
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