Editorial
Nonlinear Operators in Fixed Point Theory with Applications to Fractional Differential and Integral Equations

Jamshaid Ahmad,1 Ahmad Saleh Al-Rawashdeh,2 Talat Nazir,1 Vahid Parvaneh,3 and Manuel De la Sen4

1Department of Mathematics, University of Jeddah, P.O. Box 80327, Jeddah 21589, Saudi Arabia  
2Department of Mathematical Sciences, UAEU, P.O. Box 15551, Al-Ain, UAE  
3Department of Mathematics, Gilan-E-Gharb Branch, Islamic Azad University, Gilan-E-Gharb, Iran  
4Institute of Research and Development of Processes IIDP, Faculty of Science and Technology, University of the Basque Country, Barrio Sarriena, P.O. Box 644 de Bilbao, Leioa, 48940 Bizkaia, Spain

Correspondence should be addressed to Jamshaid Ahmad; jamshaid_jasim@yahoo.com

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Fixed point theory is a beneficial resource for the research and study of nonlinear analysis, optimization theory, and variational inequalities. In the last few decades, the problem of nonlinear analysis with its relation to fixed point theory has emerged as a rapidly growing area of research because of its applications in game theory, optimization problem, control theory, integral and differential equations and inclusions, dynamic systems theory, signal and image processing, and so on.

Due to the importance of fixed point theory and its applications, it was worthwhile to publish a special issue on this topic to highlight recent advances made by mathematicians actively working in this area.

This special issue promoted research in the field of fixed point theory with applications to Fractional Differential and Integral Equations. This special issue focused on the latest achievements on fixed point theorems concerning generalized contractions and accepted good-quality papers containing original research results with exceptional merit.

The selected and published papers can be entered in the following areas.

L. He et al. established the existence results for a class of fractional differential equations $D^\alpha x(t) = f(t, x(t), D^{\alpha-1} x(t))$, with one of the following boundary value conditions: $x(0) = A$ and $D^{\alpha-1} x(1) = B$ or $D^{\alpha-1} x(0) = A$ and $x(1) = B$, where $1 < \alpha \leq 2$ is a real number, $D^\alpha x(t)$ is the conformable fractional derivative, and $f : [0, 1] \times \mathbb{R}^2 \to \mathbb{R}$ is continuous by using some topological techniques.

J. Zhang et al. studied the Atangana-Baleanu fractional derivative of fuzzy functions based on the generalized Hukuhara difference and proved the generalized necessary and sufficient optimality conditions for problems of the fuzzy fractional calculus of variations with a Lagrange function.

The new kernel of $gH$-Atangana-Baleanu fractional derivative has no singularity and no locality, which was not precisely illustrated in the previous definitions.

A. Petruşel et al. introduced some new classes of generalized F-contractions and established certain fixed point results for such mappings in the setting of $b$-metric-like spaces. They also applied the abstract results in the study of the existence of a solution for an integral equation problem and for a boundary value problem related to a real-life mathematical model, namely, the problem of conversion of solar energy to electrical energy.

T. Rasham et al. introduced the notion of $\alpha_*$-dominated multivalued mappings and obtained some fixed point results for these mappings satisfying generalized contractive condition on a closed ball in complete dislocated metric space.

B. Li and H. Huang obtained some fixed point results for weak $\varphi$-contractions in cone metric spaces over Banach algebras. They also provided some examples and applications to the existence and uniqueness of a solution to two classes of equations.
X. Liu et al. established the existence and uniqueness of common coupled fixed point of four self-mappings for Geraghty-type contraction using weakly compatible mappings in partially ordered metric spaces with common limit range property.

M. Nazam et al. manifested some common fixed point theorems for four maps satisfying Ciric type $F$-contraction and Hardy-Rogers type $F$-contraction defined on complete $b$-metric spaces.

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*Jamshaid Ahmad*
*Ahmad Saleh Al-Rawashdeh*
*Talat Nazir*
*Vahid Parvaneh*
*Manuel De la Sen*