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Editorial

Special issue "General algebraic structures and fuzzy algebras"

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D. Hilbert proposed a system of axioms, and we can construct several mathematical structures by giving suitable axioms on a set. BCK/BCI-algebras are algebraic structures that describe fragments of the propositional calculus involving implication known as BCK/BCI-logics. As generalizations of BCK/BCI-algebras, several algebras have been developed by choosing some axioms based on several axioms/conditions in BCK/BCI-algebras, and studied some connections between groupoid theory and BCK/BCI-algebras by many researchers.

General algebraic structures including BCK/BCI-algebras contain both algebraic structures and ordered structures, and some relations with several logics. This have been developed with the fuzzy theory, and we called them fuzzy algebras.

After a careful refereeing with at least 2 referees per submission, only 7 papers have been accepted for this special issue. This means that the editors selected valuable research papers among many submitted papers. The accepted papers of editors were reviewed by anonymous referees. It keeps on the quality of journal by clarity and rigorous process.

In the first accepted paper, Donganont, Ahn and Kim introduce several co-associative laws and the notion of a pre-B-algebra. They show that every B-algebra is both a pre-B-algebra and a $\perp$-algebra, and apply the notions of a post groupoid and a pre-semigroup of a groupoid to the set $(\mathbb{N}, +)$ of all nonnegative integers. They prove that the groupoid $(\mathbb{N}, +)$ cannot be a post groupoid of a B-algebra or an edge d-algebra.

The second published paper by Chen, Zhu, Islam and Yang studied a centralized solution in max-min fuzzy relation inequalities. The max-min fuzzy relation inequalities system was applicable to the peer-to-peer network considering the highest download traffic among the terminals. They introduce the concept of the widest symmetrical interval solution to embody the stability of a given feasible scheme. Some effective procedures are proposed to find the widest symmetrical interval system regarding a provided solution.

In the next paper, Jun, Bandaru and Alali introduce the notion of an $\Omega_{(l,r)}$-endomorphic GE-derivation, and explore the conditions for an $\Omega_{(l,r)}$-endomorphic GE-derivation to be order preserving

mapping. Moreover, they show that the f-kernel and Ω-kernel of an $\Omega_{(l,r)}$-endomorphic GE-derivation formed by the $\Omega_{(l,r)}$-endomorphic GE-derivation turns out to be GE-subalgebras.

The next paper by Senturk, Oner, Turan, Gurbuz and Ordin present a novel exploration of the construction of Riečan, Bosbach, internal, and general states within the framework of Sheffer stroke BCK-algebra. They demonstrate that a Riečan state can correspond to a Bosbach state and vice versa, revealing significant interconnections between these concepts. They show that each Sheffer stroke BCK-algebra retains its structure under an internal state. Moreover, they provide compelling examples and fundamental algorithms, underscoring the practical significance of their study across various fields including artificial intelligence, computer science, and quantum logic.

The next paper by Yang, Roh and Jun deals with the concept of $OBCI$-algebras as a partially ordered generalization of BCI-algebras. They introduce the notions of $OBCI$-sugalgebras and (closed) $OBCI$filters of $OBCI$-algebras, and discuss some relations between the $OBCI$-subalgebras and $OBCI$-filters.

In the next paper, Niya, Babaei and Rezaei construct a semi-ring on a nexus and define a fuzzy sub-semi-ring associated with nexus. They provide fuzzy versions of some well-known crisp concepts over a nexus, and obtain some relationships between sub-semi-ring and fuzzy sub-semi-ring of a nexus. Moreover, they verify some concepts of a fuzzy quotient of a nexus semi-ring.

In the last accepted paper, Nakkasen, Jodnok and Chinram apply the notions of Fermatean fuzzy left (resp., right) hyperideals and Fermatean fuzzy (resp., generalized) bi-hyperideals in semihypergroups to characterize intra-regular semihypergroups. They introduce the concept of Fermatean fuzzy interior hyperideals of semihypergroups and use these properties to describe the class of intra-regular semihypergroups. Moreover, they demonstrate that Fermatean fuzzy interior hyperideals coincide with Fermatean fuzzy hyperideals in intra-regular semihypergroups.

Finally, as a guest editor, I'd like to express my great thanks to the editorial staff of the journal AIMS Mathematics for their sincere support and all reviewers for their insightful and timely reports. I hope the readers of this special issue may find creative ideas for their future research.

Guest editors:

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Conflict of interest

The authors hereby declare that there are no conflicts of interest regarding the publication.