

Guest Editorial Preface

Special Issue on “Theory and Applications of Soft Sets in Fuzzy and Related Contexts”

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INTRODUCTION

Most of our real-life problems in engineering, social and medical science, economics, environment etc. involve imprecise data and their solutions involve the use of mathematical principles based on modeling uncertainty and imprecision. To handle such situations, a number of theories have been proposed. Some of them are probability, fuzzy sets, rough sets etc. All these theories, however, are associated with an inherent limitation, which is the inadequacy of the parameterization tool associated with these theories. A Soft set is a parameterized general mathematical tool which deals with a collection of approximate descriptions of objects. Each approximate description has two parts, a predicate and an approximate value set. This theory represents a promising technique in imperfect data analysis which has found interesting extensions and various applications in handling imperfect knowledge. This special issue is devoted to the advancement of the theory and application of soft sets especially in the fuzzy environment.

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In this regard, the first article is a brief review of the articles on fuzzy soft sets and its hybridizations, developed in the last one and half decades (2001-2015) and explains their evolution in decision making environments.

In the second article an Interval Valued Fuzzy Soft set Based Optimization Algorithm for High Yielding Seed Selection is developed. Soft set has enough of parameterization tools to support and hence is the most suitable one for such a study. A real database of seeds is used for experimental verification of the efficiency of the algorithm. The use of signed priorities and intervals for the membership of values for entities makes the study more efficient and realistic.

Strengthening the theoretical developments in fuzzy soft sets, third article introduces the Cech fuzzy soft closure spaces and its basic properties are studied. It is shown that for each Cech fuzzy soft closure space there is an associated fuzzy soft topological space. In addition, the concepts of subspace, sum and continuous mapping in this context are also introduced.

Fourth article introduces an Intuitionistic Fuzzy Neighborhood Rough set Model for Feature Selection. Using this model, a greedy attribute reduction algorithm is given. This approach is applied to an example data set and a reduct set is obtained.

In the fifth article, author explores the concepts of soft relation on a soft set, soft equivalence relation on a soft set, soft graph using soft relation, vertex chained soft graph and edge chained soft graph and investigate various types of operations on soft graphs such as union, join and complement. Further it is established that every fuzzy graph is an edge chained soft graph.

Combining the notions of soft sets and neutrosophic sets, sixth article initiates the study of Γ -semirings, an extension of semirings, and its ideals by neutrosophic soft sets. After proposing basic definitions some characterization theorems in this context are provided.

CONCLUSION

The theory of soft sets now encompasses a well-organized corpus of basic notions and numerous works now combine soft sets with other scientific disciplines as well as modern technologies. It is earnestly hoped that this special issue is beneficial to the international advancement of the theory and application of soft sets and applications.

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