

# FUZZY SOFT TOPOLOGY

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## Abstract

In the present paper we introduce the topological structure of fuzzy soft sets and fuzzy soft continuity of fuzzy soft mappings. We show that a fuzzy soft topological space gives a parametrized family of fuzzy topological spaces. Furthermore, with the help of an example it is shown that the constant mapping is not continuous in general. Then the notions of fuzzy soft closure and interior are introduced and their basic properties are investigated. Finally, the initial fuzzy soft topology and some properties of projection mappings are studied.

**Keywords:** Fuzzy soft sets, Fuzzy soft topology, Fuzzy soft continuity, Fuzzy soft closure and interior, Fuzzy soft product topology.

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## 1. Introduction

The notion of a fuzzy set was introduced by Zadeh [21] in his classical paper of 1965. Three years later, Chang [4] gave the definition of fuzzy topology, which is a family of fuzzy sets satisfying the three classical axioms. Since Chang applied fuzzy set theory into topology many topological notions were introduced in a fuzzy setting. In 1976, Lowen [9] introduced a more natural definition of fuzzy topology which was different from Chang's definition.

In 1999, the Russian researcher Molodtsov [14] introduced the concept of a soft set, and started to develop the basics of the corresponding theory as a new approach for modeling uncertainties. He pointed out several directions for the applications of soft sets, such as game theory, Riemann integration, theory of measurement, smoothness of functions and so on. At present, works on soft set theory and its applications are progressing rapidly in various fields. Maji *et al.* [11, 12] presented some new definitions on soft sets and discussed in detail the application of soft set theory in decision making problems. Chen *et al.* [5] studied the parametrization reduction of soft sets. Maji *et al.* [10] combined fuzzy sets and soft sets and introduced the concept of fuzzy soft sets. To continue the

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