SOFT N-TOPOLOGICAL SPACES

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Abstract*.* Very recently, the idea of studying structures equipped with two or more soft topologies has been considered by several researchers. Soft bitopological spaces were introduced and studied, in 2014, by Ittanagi as a soft counterpart of the notion of bitopological space. and, independently, in 2015, by Naz, Shabir and Ali. In 2017, Hassan too introduced the concept of soft tritopological spaces and gave some first results. The notion of N-topological space related to ordinary topological spaces was instead introduced and studied, in 2011, by Tawfiq and Majeed. In this paper we introduce the concept of Soft N-Topological Space as generalization both of the concepts of Soft Topological Space and N-Topological Space and we investigate such class of spaces and their basic properties with particular regard to their subspaces, the parameterized families of crisp topologies generated by them and some new separation axioms called N-wise soft T_0, N-wise soft T_1, and N-wise soft T_2.

1. Introduction

Inspired by a Pawlak's idea [32], in 1999, Molodtsov [27] initiated the novel concept of Soft Sets Theory as a new mathematical tool and a completely different approach for dealing with uncertainties while modelling problems in computer science, engineering physics, economics, social sciences and medical sciences. Molodtsov defines a soft set as a parameterized family of subsets of universe set where each element is considered as a set of approximate elements of the soft set.

The absence of any restrictions on the approximate description in Soft Set Theory makes it very convenient and easy to apply respect to other existing methods as Probability Theory and Fuzzy Set Theory. In fact, we can define and use any kind of parametrization with the help of words, sentences, real numbers, real functions, mappings, etc.

In the past few years, the fundamentals of soft set theory have been studied by many researchers.