
WIJSMAN CONVERGENCE OF SEQUENCES OF SOFT SETS

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ABSTRACT

The concept of convergence is one of the most crucial in mathematics, intricately tied to the mathematical structures in which it is defined and facilitating a deeper understanding of these structures. There exist numerous types of convergence, both topological and non-topological, within the same mathematical framework that can be compared to one another. One such convergence type is Wijsman convergence, which defines the convergence of sequences of closed sets to a closed set, analogous to how convergence of sequences of points is defined in a metric space. Initially defined by R. A. Wijsman, this concept had been used previously by Z. Frolík and Hausdorff for appropriate metric spaces. Wijsman convergence, defined with respect to a metric, is a variation of Hausdorff convergence. It establishes a topology on the family of closed sets of a metric space, where this topology can vary even for uniformly equivalent metrics. Another focus of our study is on soft sets, introduced by Molodtsov as a method to handle uncertainties where traditional set concepts are inadequate. While there are studies on the topological convergence of sequences of soft points in topological spaces formed by soft sets, there has been no specific investigation into the convergence of sequences of soft sets. In parallel with the classical metric definition, the concept of soft metric is defined on the set of soft points, which is a special case of soft sets. Hence, considering Wijsman convergence for sequences of closed soft sets using this soft metric concept is natural. Consequently, in this study, we define and explore the Wijsman convergence of sequences of closed soft sets to a closed soft set in a soft metric space, investigating their general properties. We introduce the notion of soft Wijsman Cauchy sequences and explore their relationship with soft Wijsman convergent sequences. Additionally, we observe the existence of other convergence types in soft metric spaces and their relationships with Wijsman convergence, aiming to contribute to the literature by integrating soft set theory with Wijsman convergence concepts.

Keywords Soft set · Soft point · Wijsman convergence

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