L-Fuzzy Rough Preproximity Spaces

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ABSTRACT

In 1965, L.A. Zadeh introduced the foundational concept of fuzzy set theory, which subsequently found applications in various branches of mathematics, including topology. After which in 1968, C.L. Chang studied fuzzy topology, R. Lowen in 1974 studied fuzzy uniformity, and A.K. Katsaras studied fuzzy proximity in 1979. Dubois and Prade established the ideas of rough fuzzy sets in 1990, based on approximations of fuzzy sets by crisp approximation spaces and crisp sets by fuzzy approximation spaces, and pointed out that a rough fuzzy set is a special case of a fuzzy rough set. The rough set theory is based on the foundation of an approximation space. In the fuzzy rough set theory, the relationship between any two elements in a set was described by a fuzzy relation instead of an equivalence relation. In this paper we generalize the concept of proximity by defining L-fuzzy rough preproximity spaces and establish a relationship between L-fuzzy rough preproximity and the concept of L-fuzzy rough pretopological spaces.

Keywords: L-Fuzzy rough set, proximity, pretopological space

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