Review of Literature

REVIEW OF LITERATURE

The study of ordered sets and ordered topological spaces has attracted the attention of many famous researchers – Eilenberg, S., Nachbin, L., Sierpinski, W., Thron, W.J., Zimmerman, S.J., Katsaras, A.K., McCartan and many others.

Nachbin studied the interdependence between topology and an order in his famous book "Topology and Order" published in 1965. In 1968, McCartan introduced T_i-order separation axioms (i = 1, 2, 3, 4) in ordered topological spaces.

The concept of a fuzzy set was introduced by Zadeh, L.A., in 1965. This concept has been applied by many authors to several branches of mathematics. One of these applications was the study of the fuzzy topological spaces.

In 1981, Katsaras, A.K., initiated the study of the relationship between fuzzy topological and order structures.

The notion of a fuzzy topological vector space was given for the first time by Katsaras, A.K., in 1977.

Bakier, M.Y., and El-Saady, K., applied the concept of a fuzzy set to the elementary theory of order and vector space structures. They consider the case in which, on a vector space structure, a fuzzy topology has been given as well as an order relation.

The first axiomatic definition of proximity was given by Efremovič, V.A., in 1950. Singal, M.K., and Sundar Lal, introduced the notion of proximity ordered spaces. In 1999, Alcantud, J.C.R., analysed the topological properties of a relevant class of topologies associated with spaces ordered by preferences.

In this review of literature a brief survey of some of the articles published on ordered topological spaces, ordered fuzzy topological spaces, proximity spaces, fuzzy proximity spaces, fuzzy vector spaces, fuzzy topological vector spaces and preference order spaces are given.

Separation axioms for topological ordered spaces

McCartan, S.D., (1968) [18]

In this paper, the author introduced T_i-order separation axioms (i = 1, 2, 3, 4) in topological ordered spaces. He obtained necessary and sufficient conditions for an ordered topological space to be T_i-ordered and proved that a T_i-ordered space is a T_{i-1} ordered space for i = 1, 2, 3, 4.

Separation axioms in ordered fuzzy topological spaces

Chaudhuri, A.K., and Das, P., (1993) [6]

T_i(i = 1, 2, 3, 4)-ordered separation axioms are defined in ordered fuzzy topological spaces and the validity of some results analogous to those in the crisp are examined.

G_δ-separation axioms in ordered fuzzy topological spaces

Elango Raja, Mallasamudram Kuppusamy Uma, Ganesan Balasubramanian, (2007) [8]

G_δ-separation axioms are introduced in ordered fuzzy topological spaces and some of their basic properties are investigated.

Supsets on partially ordered topological linear spaces

Koshi, S., and Kommro, N., (2000) [16]

The authors introduced supsets and infsets for subsets of a partially ordered topological linear space. These notions generalize the usual notions of supremum and inflimum in Riesz spaces. They investigated properties of supsets and infsets in this paper.

A note on the fixed points of fuzzy maps on partially ordered topological spaces

Chitra, A., (1986) [7]

In this paper, a fixed point theorem for fuzzy maps on partially ordered topological spaces is obtained.

Fuzzy proximity spaces

Katsaras, A.K., (1979) [12]

In this paper, the author introduced a fuzzy proximity structure on a set. It is proved that a proximity structure δ on a set X induces a fuzzy proximity $i(\delta)$ on X. Conversely given a fuzzy proximity relation δ_0 there is a proximity relation δ such that $\delta_0 = i(\delta)$. With every fuzzy proximity δ, a fuzzy topology $\tau(\delta)$ is associated such that every proximaity continuous function is continuous.

On fuzzy proximity spaces

Gonzalez Juarros, E., Perez-Castrillo, J.D., and De Prada Vicente, M.A., (1993) [10]

In this paper, the authors presented a new version of the nearness between fuzzy sets and study the relations between this fuzzy proximity and the fuzzy topology as well as the fuzzy proximity neighbourhoods derived from it. They also gave a definition of fuzzy proximity mappings and study their behaviour.

Fuzzy vector spaces and fuzzy topological vector spaces

Katsaras, A.K., and Liu, D.B., (1977) [11]

In this paper, the authors applied the concept of a fuzzy set to the elementary theory of vector spaces and topological vector spaces and obtained some interesting results.

Fuzzy topological vector spaces I

Katsaras, A.K., (1981) [14]

In this paper, some of the properties of fuzzy topological vector spaces are investigated. Also, there are given necessary and sufficient conditions for a family of fuzzy sets, in a vector space E, to be the family of all neighbourhoods of zero for a fuzzy linear topology.

Characterizations of minimal T_3 L-fuzzy topological spaces

Sheng-Gang Li, and Zong-Ben Xu, (2000) [21]

Let L be a completely distributive complete lattice, and X a non-empty set. Then L^X is also a completely distributive complete lattice. In this paper, the authors proved the characterization theorem of the minimal elements of T_3LX where T_3 LX is the set of all T_3 closed topologies on L^X ordered by inclusion. They also present a method for constructing a T_3 closed topology strictly weaker than a given non-minimal T_3 closed topology on L^X.

Generating fuzzy topologies with semi-closure operators

Klein. J., (1983) [15]

Let X be an L-fuzzy topological space. For $\alpha \in L-\{1\}$ and $A \subset X$, $x \in C_\alpha(A)$ if and only if G fuzzy open and $G(x) > \alpha$ imply there is $a \in A$ with $G(a) > 0$.

Under certain restrictions on α, which are always satisfied if L is linearly ordered, C_{α} is semi-closure operator. The paper contains necessary and sufficient conditions under which a collection of semi-closure operators generates a fuzzy topology. In general, such a collection does not generate a unique topology. The class of topologies generated is shown to be closed under suprema and its largest member is characterized. The topology for the fuzzy unit interval is characterized among those generated by its α-closure operators.

Topological properties of spaces ordered by preferences

Alcantud, J.C.R., (1999) [1]

In this paper, the author analysed the main topological properties of a relevant class of topologies associated with spaces ordered by preferences (asymmetric, negatively transitive binary relations). This class consists of certain continuous topologies which include the order topology. The concept of saturated identification is introduced in order to provide a natural proof of the fact that all these spaces possess topological properties analogous to those of linearly ordered topological spaces.