Chattopadhyay, K. C.; **Samanta, S. K.**
Fuzzy topology: Fuzzy closure operator, fuzzy compactness and fuzzy connectedness. (English) Zbl 0809.54005
Fuzzy Sets Syst. 54, No. 2, 207-212 (1993).

By a fuzzy topology on a set X the authors realize a mapping $\tau : I^X \to I$ such that $\tau(0) = \tau(1) = 1$, $\tau(U \wedge V) \geq \tau(U) \wedge \tau(V)$ for any $U, V \in I^X$, and $\tau(\bigvee U_i) \geq \bigwedge \tau(U_i)$ for every family $\{U_i : i \in \mathcal{I}\} \subset I^X$. (The authors make reference to their paper [the authors with *R. N. Hazra*, ibid. 49, 237-242 (1992; Zbl 0762.54004)], however earlier such fuzzy topologies were considered in reviewer's papers, see e.g. [Rend. Circ. Mat. Palermo, II. Ser. Suppl. 11, 89-103 (1985; Zbl 0638.54007)].)

In this paper a fuzzy topology is characterized by the so-called fuzzy closure operator which in fact is a mapping $\mathrm{Cl} : I^X \times (0, 1] \to I^X$ satisfying certain conditions. Fuzzy closure operators are used, in particular, to characterize continuity of mappings of fuzzy topological spaces. The authors consider also the properties of compactness and connectedness for fuzzy topologies. These notions are introduced levelwise: namely, a fuzzy topology τ is said to have a property P iff all its level Chang fuzzy topologies $\tau^{-1}[\alpha, 1]$, $\alpha \in (0, 1]$, have this property P.

Reviewer: A.Šostak (Riga)

MSC:

54A40   Fuzzy topology

Cited in **32** Documents

Keywords:

fuzzy compactness; fuzzy connectedness; fuzzy closure operator

Full Text: DOI

References:

[1]   Ajmal, N.; Kohli, J.K., Connectedness in fuzzy topological spaces, Fuzzy sets and systems, 31, 369-388, (1989) · Zbl 0684.54004

[2]   Chang, C.L., Fuzzy topological spaces, J. math. anal. appl., 24, 182-190, (1968) · Zbl 0167.51001

[3]   Chattopadhyay, K.C.; Hazra, R.N.; Samanta, S.K., Gradation of openness; fuzzy topology, Fuzzy sets and systems, 49, 237-242, (1992) · Zbl 0762.54004

[4]   Gantner, T.E.; Steinlage, R.C.; Warren, W.H., Compactness in fuzzy topological spaces, J. math. anal. appl., 62, 547-562, (1978) · Zbl 0372.54001

[5]   Pu Pao-Ming; Liu Ying-Ming, Fuzzy topology—I, neighbourhood structure of a fuzzy point and Moore-Smith convergence, J. math. anal. appl., 76, 571-599, (1980) · Zbl 0447.54006

[6]   Lowen, R., Fuzzy topological spaces and fuzzy compactness, J. math. anal. appl., 50, 621-623, (1976) · Zbl 0342.54003

[7]   Lowen, R., A comparison of different compactness notions in fuzzy topological spaces, J. math. anal. appl., 64, 446-454, (1978) · Zbl 0381.54004