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Fuzzy connections on adjoint triples. (English) Zbl 07181611

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Summary: In this paper, we introduce the notion of residuated and Galois connections on adjoint triples and investigate their properties. Using the properties of residuated and Galois connections, we solve fuzzy relation equations and give their examples.

MSC:

[03E72](#) Theory of fuzzy sets, etc.

[03G10](#) Logical aspects of lattices and related structures

[06A15](#) Galois correspondences, closure operators (in relation to ordered sets)

[54F05](#) Linearly ordered topological spaces, generalized ordered spaces, and partially ordered spaces

Keywords:

adjoint triples; residuated connections; Galois connections; fuzzy relational erosion(dilation); fuzzy closure (interior) operator

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References:

- [1] A.A. Abdel-Hamid, N.N. Morsi, Associatively tied implications, *Fuzzy Sets and Systems*, 136 (3) (2003), 291-311. · [Zbl 1042.03021](#)
- [2] R. Böhmler, *Fuzzy Relational Systems*, Kluwer Academic Publishers, New York, 2002.
- [3] M.E. Cornejo, J. Medina, E. Ramírez, A comparative study of adjoint triples, *Fuzzy Sets and Systems*, 211 (2013), 1-14.
- [4] M.E. Cornejo, J. Medina and E. Ramírez, Multi-adjoint algebras versus non-commutative residuated structures, *International Journal of Approximate Reasoning* 66 (2015), 119-138. · [Zbl 1350.06003](#)
- [5] N. Madrid, M. Ojeda-Aciego, J. Medina and I. Perfilieva, L-fuzzy relational mathematical morphology based on adjoint triples, *Information Sciences* 474 (2019), 75-89.
- [6] P. Hájek, *Metamathematics of Fuzzy Logic*, Kluwer Academic Publishers, Dordrecht, 1998.
- [7] U. Höhle, E.P. Klement, *Non-classical logic and their applications to fuzzy subsets*, Kluwer Academic Publishers, Boston, 1995.
- [8] U. Höhle, S.E. Rodabaugh, *Mathematics of Fuzzy Sets, Logic, Topology and Measure Theory*, The Handbooks of Fuzzy Sets Series, Kluwer Academic Publishers, Dordrecht, 1999.
- [9] Y.C. Kim, Join-meet preserving maps and Alexandrov fuzzy topologies, *Journal of Intelligent and Fuzzy Systems* 28 (2015), 457-467. · [Zbl 1351.06002](#)
- [10] M. Kryszkiewicz, Rough set approach to incomplete information systems, *Information Sciences* 112 (1998), 39-49. · [Zbl 0951.68548](#)
- [11] Z. Pawlak, Rough sets, *Internat. J. Comput. Inform. Sci.*, 11 (1982), 341-356. · [Zbl 0501.68053](#)
- [12] Z. Pawlak, *Rough sets: Theoretical Aspects of Reasoning about Data*, System Theory, Knowledge Engineering and Problem Solving, Kluwer Academic Publishers, Dordrecht, The Netherlands (1991)
- [13] I. Perfilieva, Finitary solvability conditions for systems of fuzzy relation equations, *Information Sciences*, 234 (2013), 29-43. · [Zbl 1284.03250](#)
- [14] I. Perfilieva and L. Noskova, System of fuzzy relation equations with inf- composition: Complete set of solutions, *Fuzzy Sets and Systems* 159 (2008), 2256-2271. · [Zbl 1183.03053](#)
- [15] E. Sanchez, Resolution of composite fuzzy relation equations, *Inform. and Control* 30 (1976), 38-48. · [Zbl 0326.02048](#)
- [16] B.S. Shieh, Solutions of fuzzy relation equations based on continuous t-norms, *Information Sciences*, 177 (2007), 4208-4215. · [Zbl 1122.03054](#)
- [17] P. Sussner, Lattice fuzzy transforms from the perspective of mathematical morphology, *Fuzzy Sets and Systems*, 288 (2016), 115-128. · [Zbl 1374.06011](#)
- [18] S. P. Tiwari, I. Perfilieva and A.P. Singh, Generalized residuated lattices based F-transformation, *Iranian Journal of Fuzzy Systems* 15 (2) (2018), 165-182. · [Zbl 1398.03219](#)
- [19] M. Ward, R.P. Dilworth, Residuated lattices, *Trans. Amer. Math. Soc.* 45 (1939), 335-354,

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