

Hua, Xiu-Juan; Zhang, Hua-Peng; Ouyang, Yao

Note on “construction of uninorms on bounded lattices”. (English) Zbl 07396272
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The existence of uninorms on bounded lattice $(L, 0, 1, \vee, \wedge)$ was proved by *F. Karaçal* and *R. Mesiar* [Fuzzy Sets Syst. 261, 33–43 (2015; Zbl 1366.03229)]. Then many papers provided particular constructions of such uninorms with neutral element $e \neq 0, 1$. Authors of this note observed that in the paper by *G. D. Çaylı* and *F. Karaçal* [Kybernetika 53, No. 3, 394–417 (2017; Zbl 1424.03060)] some assumptions about lattice L are false (e.g. assumption “for every $x, y \in L$, if $x, y \parallel e$, then $x \vee y > e$ ” is false, if such $x \in L$ exists, because then $x \vee x = x \parallel e$). Such assumption is formally true, if all lattice elements are comparable with e , i.e. $L = [0, e] \cup [e, 1]$ with lattice intervals, what reduces many considerations and results of the mentioned paper. Another correction concerns direct descriptions in L^2 of constructed uninorms, where domains of diverse formulas should be disjoint (except for $[0, e]^2 \cap [e, 1]^2 = \{(e, e)\}$).

This note brings a generalized construction of uninorms, new assumptions and new proof. The construction uses closure and interior operators (cf. *Y. Ouyang* and *H.-P. Zhang* [Fuzzy Sets Syst. 395, 93–106 (2020; Zbl 1452.03120)]).

Reviewer’s remark: Authors use notation I_e without explanation (it is copied from reference papers and denotes the set of all elements of lattice L non-comparable with e).

Reviewer: [Józef Drewniak \(Rzeszów\)](#)

MSC:

- 03G10 Logical aspects of lattices and related structures
- 03B52 Fuzzy logic; logic of vagueness
- 06B05 Structure theory of lattices
- 06A15 Galois correspondences, closure operators (in relation to ordered sets)
- 06B20 Varieties of lattices
- 03E72 Theory of fuzzy sets, etc.

Keywords:

bounded lattice; ordered semigroup; triangular norm; triangular conorm; uninorm; closure operator; interior operator

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