

APPROXIMATION THEORY IN UP-ALGEBRAS BASED ON INTUITIONISTIC FUZZY SETS

(Teori Penghampiran dalam Aljabar-UP Berdasarkan Set Kabur Berintuisi)

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ABSTRACT

This paper discusses the upper and lower approximations of Atanassov intuitionistic fuzzy sets in crisp and fuzzy approximation spaces in which both constructive and axiomatic approaches are used. In the constructive approach, concepts of intuitionistic fuzzy sets are defined, properties of intuitionistic fuzzy approximation operators are examined. Different classes of intuitionistic fuzzy set algebras are obtained from different types of fuzzy relations. In the axiomatic approach, an operator-oriented characterization of intuitionistic fuzzy sets is proposed.

Keywords: UP-algebra; intuitionistic fuzzy set

ABSTRAK

Kertas kerja ini membicarakan penghampiran atas dan bawah bagi set kabur intuisi Atanassov dalam ruang penghampiran yang jelas dan kabur di mana kedua-dua pendekatan konstruktif dan aksiomatik digunakan. Dalam pendekatan konstruktif, konsep set kabur intuisi ditakrifkan, sifat pengendali penghampiran kabur intuisi diperiksa. Kelas algebra set kabur intuisi yang berbeza diperoleh daripada jenis hubungan kabur yang berbeza. Dalam pendekatan aksiomatik, pencerian berorientasikan operator bagi set kabur intuisi dicadangkan.

Kata kunci: UP-aljabar; set kabur intuisi

References

- Atanassov K. T. 1986. Intuitionistic fuzzy sets. *Fuzzy Sets and Systems* **20** (1): 87–96.
- Guntasow T., Sajak S., Jomkham A. & Iampan A. 2017. Fuzzy translations of a fuzzy set in up-algebras. *J. Indones. Math. Soc.* **23** (2): 1–19.
- Iampan A. 2017. A new branch of the logical algebra: Up-algebras. *J. Algebra Relat. Top.* **5** (1): 35–54.
- Iampan A. 2019. Multipliers and near up-filters of up-algebras. *J. Discrete Math. Sci. Cryptography* **24** (3): 667–680.
- Jun Y. B., Muhiuddin G. & Romano S. A. 2021. On filters in up-algebras, a review and some new reflections. *J. Int. Math. Virtual Inst.* **11** (1): 35–52.
- Kesorn B., Maimun K., Ratbandan W. & Iampan A. 2015. Intuitionistic fuzzy sets in up-algebras. *Ital. J. Pure Appl. Math.* **34**: 339–364.
- Mostafa S. M., Naby M. A. A. & Yousef M. M. M. 2011. Ifuzzy ideals of ku-algebras. *Int. Math. Forum* **63**: 3139–3149.
- Satirad A., Chinram R. & Iampan A. 2021. Pythagorean fuzzy sets in up-algebras and approximations. *AIMS Mathematics* **6** (6): 6002–6032.
- Somjanta J., Thuekaew N., Kumpeangkeaw P. & Iampan A. 2016. Fuzzy sets in up-algebras. *Ann. Fuzzy Math. Inform.* **12** (6): 739–756.
- Thongngam N. & Iampan A. 2019. A novel approach to intuitionistic fuzzy sets in up-algebra. *Korean J. Math.* **27** (64): 1077–1108.

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