

On approximation under L -fuzzy information

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Our main purpose is to develop methods of approximation under fuzzy information described by L -sets, where L is a completely distributive lattice. It is closely related to our previous work on approximation theory in fuzzy context [1] and [2].

We consider the problem of approximation of an operator $B : X \rightarrow Y$ defined in a set X and taking values in a normed space Y under information given by an operator $A : X \rightarrow L^{R^n}$, i.e. approximating Bx we suppose that an element $x \in X$ is given by an L -set $Ax : R^n \rightarrow L$.

By a method for solving this problem we mean any operator $\varphi : R^n \rightarrow Y$ (in the classical case see e.g. [3]), which allows us to get an approximation of the exact value Bx for each $x \in X$. In this talk we investigate the error $e(\varphi)$ of approximation by a method φ introduced in our talk [4]. In particular we analyse interpolating methods and spline methods.

References

- [1] S. Asmuss, A. Šostak: *Extremal problems of approximation theory in fuzzy context*. Fuzzy Sets and Systems, **105** (199) 249–258.
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- [3] J.F. Traub, H. Wozniakowski: *A general theory of optimal algorithms*. New York, Academic Press, 1980.
- [4] S. Asmuss: *Some aspects of approximation under fuzzy information*. 1st Czech-Latvian Seminar on Advanced Methods in Soft Computing, November 19-21, 2008, Trojanovice, Czech Republic. Abstracts, p 9.