

Research report from the Computer Center of the L. Eötvös University

In the Department of Operations Research at the Computer Center of the L. Eötvös University a small group of researchers has been working on the theory and application for fuzzy sets and systems since the beginning of the eighties. Our group has been supported by the Hungarian Scholars' and Hungarian Young Scholars' Funds. The specific topics of research as well as researchers involved may be seen from the following survey and list of publications.

Margit Kovács (Ph.D., the leader of the group) deals with mathematical programming under uncertainty, first of all with ill-posed and fuzzy problems. She is mainly interested in

- theoretical foundation of fuzzy optimality concepts,
- stability properties of the solution and searching the connection between classical regularization methods and the fuzzification,
- economical and technical applications of fuzzy theory.

She is the chairperson of the Organizing Committee of the 3rd joint IFSA-EC and EURO-WG workshop, and the general secretary of the Hungarian Section of the IFSA-EC.

János C.Fodor (Univ.Dr.) is active in the following topics:

- operations on fuzzy sets,
(basic theoretical questions of t-norms, weak t-norms and fuzzy implications)
- fuzzy relations,
(general definitions and basic properties of fuzzy strict preference, indifference and incomparability being in harmony with set-theoretic operations; investigation of fuzzy biorder relations and their important particular classes)

He has been working on his Ph.D. Thesis on *Fuzzy Preference Modelling*.

Róbert Fullér's (Ph.D.) research interests are presently centered on

- fuzzy mathematical programming problems with fuzzy number parameters,
- linear and non-linear systems with fuzzy numbers,
- t-norm-based operations on fuzzy sets,
- possibility theory and extension of classical theorems of analysis and probability theory to fuzzy environment.

He is a member of the International Fuzzy Systems Association, the American Mathematical Society, and secretary of the Hungarian Section of the IFSA-EC.

Lajos Gergó (Univ.Dr.) is interested in

- topological properties of fuzzy numbers and investigates metric spaces of normal, fuzzy convex, upper-semicontinuous, compactly supported fuzzy numbers of R^n .

His further goal is to solve certain problems of fuzzy numerical analysis e.g. fuzzy differential equations and least squares approximation.

Tibor Keresztfalvi is the youngest member of the group. His main interests are concentrated on the following topics:

- t-norm-based operations on fuzzy intervals,
- investigation of extended functions, (defined via a sup-t-norm convolution)

He has been working on his University doctor thesis on the topic *Investigation of t-norm-based Extended Fuzzy Functions*.

Attila Kiss investigates

- the classical and fuzzy relational database theory. He is particularly interested in the investigations of the dependencies of databases, such that the implication problem of the dependencies and the application of the classical decision and proof procedures to the fuzzy relational databases.
- the generalization of the dependencies to the case of fuzzy relations using the first or higher order fuzzy logic in order to develop some means that help to carry out the normalization of databases.
- the problem: how the information stored in fuzzy databases can be measured?

He has been working on his University doctor thesis on the topic *Fuzzy Database Systems*.

József Sándor (Research Institute for Agricultural Economics) is mainly interested in

- fuzzy clustering, fuzzy regression methods and using fuzzy theory in mathematical modelling. Starting from the classical probabilistic and statistical methods used frequently for the modelling of agricultural processes, he developed a fuzzy approach, which seems to be more adequate than the older ones.

He has been working on his Ph.D. Thesis on the topic *Fuzzy Linear Regression Modells*.

PUBLICATIONS

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23. M. Kovács, F. P. Vasil'ev and R. Fullér, On Stability in Fuzzified Linear Equality Systems, *Vestnik MGU*, 1989, No.1 5-9 (in Russian).
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26. M. Kovács and P. Várlaki, An estimation for realization rate of competitive market equilibrium with fuzzy set technique, In: *Models and Algorithms*, Budapest, ELTE SZK/27, 1982 33-42 (the Hungarian version of this paper was published in Sigma).
 27. M. Kovács, Fuzzy clustering via goal programming, In: *Proc. of 30. Intern. Wiss. Koll. TH Ilmenau, 1985. Vortragsreihe "Mathematische Optimierung-Theorie und Anwendungen"*, 75-77.
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International Cooperations.

Numerous fuzzy researchers have already been invited at the Seminar for Fuzzy Sets and Systems to present their specific research domain. Recently we started cooperation with other European Universities: University of Trento, Italy and University of Liege, Belgium.

We organize the 3rd joint IFSA-EC and EURO-WG workshop on Fuzzy Sets to be held in December 11-13, 1990 in Visegrád, Hungary.

We would like to cooperate with anyone who is also interested in the same topics.



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