

DECISION MAKING METHODS BASED ON ELEMENTS OF
INTUITIONISTIC FUZZY SETS AND THEIR SOFTWARE IMPLEMENTATION

(project)

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The basic aim of the project is that the following four activities are envisaged:

- A1. theoretical research related to the construction and description of some new decision making methods;
- A2. methodological research for the use of these methods in practice;
- A3. development of software implementation of the decision making methods from A1;
- A4. construction of examples for applications of decision making methods from A1 in medicine.

The basic aims of the theoretical research (A1) are to construct tools for:

1. non-linear ordering of some given criteria;
2. determining relations among the criteria;
3. decision-making (classification) rules on training data set using the non-linearly ordered criteria from part 1;

4. detection of contradictions between classification rules orders and new (real) data after part 3, if they exist;
5. classification of new data, using the non-linearly ordered criteria from part 1 and the data already clustered after parts 3 and 4;
6. estimation of the results of the classification and of the decision making;
7. estimation of the competence of the experts participating in the above processes.

All above tools will be described in terms of the Intuitionistic Fuzzy (IF) set theory, because it allows more detailed descriptions than the ordinary fuzzy set theory. Other basic mathematical methods which will be used are related to the graph theory (to the IF-graphs), to the matrix theory (to the index matrices and the index matrix representation of graphs), to the IF variant of the statistic (which will be an object of further research).

Within the framework of the methodological research (A2), ways and means will be described for using these algorithms in real processes (A4); and of the software implementation (A3), means will be developed for applications of the results from (A1).

If there are users interested in the project, then aim (A4) can be extended with applications of the decision making methods described in (A1) to other areas.