

The Characteristics of Procedures and some Principles for Membership Function Estimations

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The paper has been aimed on evaluation and generalization of knowledge and experiences gained so far in connection with the theory of fuzzy sets application. It has been oriented especially on the needs of those who formulate the database for computation. The experiences from the area of innovation projects modelling have been mainly used.

The general procedures for gathering and presenting the data for jobs and computation included in the paper can be summarized as follows:

- 1) To identify and define all input variables regardless their quantifiability. To analyse the character and the scope of output.
- 2) To select evaluating terms for input variables respecting the given aim and the extent of output.
- 3) To estimate the disponible size of a particular input variable influencing the output in certain interval(s), i.e. to set up the reference set.
- 4) To rank the evaluating terms in columns of particular matrices (see 2) and according to 3) to set up the reference set in rows of the matrices.

- 5) Such a matrix expresses the relation between the evaluating terms and the reference set of the given variable, i.e., the relation between the fuzzy subsets corresponding to particular evaluation terms and their universe of discours.
- 6) Such matrices have to be constructed for each input influencing the output.
- 7) The matrix of the output is being constructed according to the same principles as mentioned above.

The construction of this matrices is not only the matter of formality. By their help all the computing procedures can be held in a very simple and straightforward manner similar to that of linear algebra.

In the paper some principles for the control of correctness as for membership function estimation are given. These principles can serve e.g. for synoptical verification of expert evaluations of particular values of membership function of the elements of fuzzy sets. There rules have been derived and generalized from a great amount of constructed, considered or simulated cases.

In spite of this it is being stressed that the validity of these principles is not absolute: the principles have to be considered casually and used with appropriate caution.

Finally, it is being reasoned that both the matrix construction, the membership functions estimation and

the preconditions for the model creation do require a close cooperation between those who prepare the database and consideration for the functioning of the model and the experts working out the construction of the model and the computing of input-output relations themselves.