ON THE LOSS OF INFORMATION DUE TO FUZZINESS IN EXPERIMENTAL OBSERVATIONS

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Abstract. The absence of exactness in the observation of the outcomes of a random experiment always entails a loss of information about the experimental distribution. This intuitive assertion will be formally proved in this paper by using a mathematical model involving the notions of fuzzy information and fuzzy information system (as intended by Tanaka, Okuda and Asai) and Zadeh's probabilistic definition. On the basis of this model we are first going to consider a family of measures of information enclosing some well-known measures, such as those defined by Kagan, Kullback-Leibler and Matusita, and then to establish methods for removing the loss of information due to fuzziness by increasing suitably the number of experimental observations.

Key words and phrases: Fuzzy information, fuzzy information system, non-parametric measures of directed divergence, probability of a fuzzy event, random experiment.