A Strong Consistency Result for Fuzzy Relative Frequencies Interpreted as Estimator for the Fuzzy-Valued Probability

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The unavoidable imprecision of measurements of continuous physical quantities can be modelled by using the concept of fuzzy numbers and fuzzy vectors. Concerning a quantitative usage of such data the classical concept of relative frequencies for real data has to be extended to so-called fuzzy relative frequencies for fuzzy data, whereby the fuzzy relative frequency of a set is a fuzzy number.

Analogous to A. Dempster's interval-valued probabilities induced by multivalued mappings fuzzy-valued probabilities induced by fuzzy random vectors are considered and analyzed. It will be shown that fuzzy relative frequencies can be interpreted as strongly consistent estimator for the corresponding fuzzy-valued probability.