

Fuzzy Probability Distributions and Bayesian Analysis

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Prior distributions in Bayesian inference are a topic of critical discussions. Therefore a more general presentation of prior information in form of generalized probability distributions, so-called fuzzy probability densities seems to be more appropriate. These generalized probability densities are based on fuzzy numbers which are special fuzzy subsets of the set of real numbers. Additionally all measurement results of continuous quantities are not precise numbers but more or less fuzzy. The best up to date description of such data are by fuzzy numbers. The combination of fuzzy prior distributions and fuzzy data yields a generalized Bayesian inference procedure taking care of the fuzziness of reality. Also the concept of HPD-regions and predictive distributions can be generalized to the situation of fuzzy information.

Key Words: Fuzzy data, fuzzy prior information, generalized Bayesian inference, fuzzy predictive distributions