An Approach to Deal with Aleatory and Epistemic Uncertainty within the Same Framework: Case Study in Risk Assessment

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Abstract

Risk assessment is an important and popular aid in the decision making process. The aim of risk assessment is to estimate the severity and likelihood of harm to human health from exposure to a substance or activity that under plausible circumstances can cause to human health. In risk assessment, it is most important to know the nature of all available information, data or model parameters. More often, it is seen that available information model parameters, data are usually tainted with aleatory and epistemic uncertainty or both type of uncertainty. When some model parameters are affected by aleatory uncertainty and other some parameters are affected by epistemic uncertainty, how far computation of the risk is concern, one can either transform all the uncertainties to one type of format or need for joint propagation of uncertainties. In this paper, an effort has been made to combine probability distributions, normal fuzzy numbers and generalized interval valued fuzzy numbers (IVFNs) within the same framework.

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