Theory and Applications of Fuzzy Random Variables

Dan Ralescu
Department of Mathematical Sciences
University of Cincinnati
Cincinnati, OH 45221-0025 USA

I. Abstract

We discuss the historical perspective of concepts of fuzziness and randomness, with emphasis on fuzzy random variables. We will describe the analysis of the interpretation, modeling, and impact of fuzzy random variables. Examples will be given of scenarios modeled by fuzzy random variables. Also, main approaches using fuzzy random variables will be discussed. The theoretical concept of expected value will be one of our main focus points. Finally, we present some statistical applications of fuzzy random variables mainly to statistical testing of hypotheses and to regression analysis with imprecise data.

II. Short Bio.

Dan Ralescu is the coauthor of the ?rst comprehensive monograph on fuzzy sets and systems, published in the early 1970s. He has authored and coauthored more than 60 papers in scienti?c Journals. In the late 1970s he has initiated the theory of fuzzy random variables and mixed models of uncertainty. His recent interests are in statistical decision- making under various kinds of uncertainty. He was awarded the IFSA Fuzzy Pioneer in 2003.