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Risk Assessment Applications of Fuzzy Logic

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Risk assessment (RA) is the overall process of risk identification, analysis, and evaluation. Fuzzy logic (FL) may be viewed, among other things, as an attempt at formalization of human capability to converse, reason, and make rational decisions in an environment of imprecision, uncertainty, incomplete or conflicting information. The motivation for combining RA and FL arises because RA often is hindered by data limitations and ambiguities, and information in linguistic variables. FL models have been shown to be effective tools in such circumstances. In this paper with Arnold F. Shapiro, we investigate FL modification of the risk matrix and the Analytic Hierarchy Process, and the role of fuzzy optimization as it relates to RA. We show examples in the four main risk areas: operational, hazard, financial, and strategic.