

Trade-Offs, Strategies and Negotiation in Engineering Design

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Abstract

Engineering design requires information to be processed and decisions to be made in the presence of significant levels of imprecision and uncertainty. Traditional approaches to engineering have focused on analyzing precise information. Our research has introduced a formal method for representing and manipulating imprecise information in engineering design to enable designers to compare the performance of design alternatives, even at the highly imprecise preliminary stages. Additionally, formal methods for trading-off multiple incommensurate aspects of design performance, and for negotiating among multidisciplinary members of design teams have been developed. The approach is related to, but distinct from, game theory and economic decision-making. These methods, including some of the computational aspects, will be described and illustrated with an example from industry.