EFFECTIVE ENGINEERING DESIGN THROUGH SIMULATION

Abstract

This paper presents a framework for designing, analyzing and improving systems and processes via discrete event simulation. The framework incorporates a robust design philosophy into a response surface metamodeling approach, and the simulation setting provides the analyst with an increased level of control relative to industrial experimentation. System optimization and improvement efforts can be carried out efficiently and effectively, providing insights into system behavior and suggesting optimal system configurations which may yield substantial improvements over those selected using more traditional approaches. One noteworthy benefit of the simulation framework is that robust design methodologies can be applied prospectively — at the inception and conceptualization phases of an engineering design project. We illustrate the method by considering the design of a small job shop.

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