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Optimization of Correlated Multiple Quality Characteristics Using Desirability Function

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Abstract

A real problem in a product or process usually possesses multiple quality characteristics. For the multiple quality characteristics optimization problem, the most popular method for simultaneous quality characteristics optimization is the desirability function approach. However, the variation and correlation between quality characteristics are usually ignored in this approach. The variation reduction through robust design introduced by Taguchi is a major concept. This research presents an approach to optimizing the correlated multiple quality characteristics based on the modified double-exponential desirability function. The implementation and the effectiveness of the proposed approach are illustrated through two examples from previously published articles.

Keywords:

multiple quality characteristics | desirability function | correlation | robust design | Taguchi method

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