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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 optimize multiple quality characteristics simultaneously using the modified desirability function approach. The effectiveness of the proposed approach is proven by a numerical example and a Taguchi method.

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