



Engineering Optimization >

Volume 40, 2008 - [Issue 6](#)

1,080	181	0
Views	CrossRef citations to date	Altmetric

Original Articles

# The use of a grey-based Taguchi method for optimizing multi-response simulation problems

Yiyo Kuo , Taho Yang & Guan-Wei Huang

Pages 517-528 | Received 24 Jan 2007, Published online: 20 May 2008

 Cite this article  <https://doi.org/10.1080/03052150701857645>

Sample our  
Engineering & Technology  
Journals



>> [Sign in here](#) to start your access  
to the latest two volumes for 14 days

 Full Article

 Figures & data

 References

 Citations

 Metrics

 Reprints & Permissions

Read this article

 Share

## Abstract

Simulation modelling is a widely accepted tool in system design and analysis, particularly when the system or environment has stochastic and nonlinear behaviour. However, it does not provide a method for optimization. In general, problems contain more than one response, which are often in conflict with each other. This article proposes a grey-based Taguchi method to solve the multi-response simulation problem. The grey-based Taguchi method is based on the optimizing procedure of the Taguchi method, and adopts grey relational analysis (GRA) to transfer multi-response problems into single-response problems. A practical case study from an integrated-circuit packaging company illustrates that differences in performance of the proposed grey-based Taguchi method and other methods found in the literature were not significant.

The grey-based Taguchi method thus provides a new option when solving a multi-response simulation-optimization problem.

Keywords:

- grey relational analysis
- integrated circuit packaging
- multiple attribute decision making
- simulation optimization
- Taguchi method

## Acknowledgements

The authors thank the anonymous company for providing the case study. This work was supported in part by the National Science Council of Taiwan, Republic of China, under grants NSC-94-2213-E-432-002 and NSC-94-2213-E-006-019.

### Related Research Data

Use of grey relational analysis to assess and optimize small biomass boilers  
Source: Fuel Processing Technology

The use of the orthogonal array with grey relational analysis to optimize the electrical discharge machining process with multiple performance characteristics  
Source: International Journal of Machine Tools and Manufacture

Control problems of grey systems  
Source: Systems & Control Letters

Artificial neural networks for job shop simulation  
Source: Advanced Engineering Informatics

OPTIMIZING MULTI-RESPONSE PROBLEMS IN THE TAGUCHI METHOD BY FUZZY MULTIPLE ATTRIBUTE DECISION MAKING  
Source: Quality and Reliability Engineering International

The use of grey-based Taguchi methods to determine submerged arc welding process parameters in hardfacing  
Source: Journal of Materials Processing Technology

People also read

Recommended articles

Cited by  
181

## Information for

Authors

R&D professionals

Editors

Librarians

Societies

## Opportunities

Reprints and e-prints

Advertising solutions

Accelerated publication

Corporate access solutions

## Open access

Overview

Open journals

Open Select

Dove Medical Press

F1000Research

## Help and information

Help and contact

Newsroom

All journals

Books

## Keep up to date

Register to receive personalised research and resources  
by email



Sign me up



Copyright © 2025 Informa UK Limited [Privacy policy](#) [Cookies](#) [Terms & conditions](#)

[Accessibility](#)

 Taylor and  
Francis Group

Registered in England & Wales No. 01072954  
5 Howick Place | London | SW1P 1WG