Mechanisms and coherences of robust design methodology: a robust design process proposal - DTU Orbit (21/12/2018)

Mechanisms and coherences of robust design methodology: a robust design process proposal

Although robust design (RD) methods are recognised as a way of developing mechanical products with consistent and predictable performance and quality, they do not experience widespread success in industry. One reason being the lack of a coherent RD process (RDP). In this contribution we analyse commonly used RD methods to identify their mechanisms and coherences and propose a RDP that is connected to the actual design tasks of the design engineer. The presented RDP comprises four main activities: (1) design and modification of the conceptual design solution, (2) measuring and modelling the robustness of the design, (3) processing and evaluation of the robustness data and (4) scaling of the design to optimise parameter and tolerance values. For each of the activities, the set of relevant RD methods is presented. The main objective of the RDP is to provide the design team with a better overview and understanding of the RD toolbox and to support the application of RD continuously throughout the product development by providing a sequential description of when to apply the methods and how they affect the robustness of the design.

General information
State: Published
Organisations: Department of Mechanical Engineering, Engineering Design and Product Development
Contributors: Göhler, S. M., Christensen, M. E., Howard, T. J.
Pages: 239-259
Publication date: 2018
Peer-reviewed: Yes

Publication information
Volume: 29
Issue number: 3-4
ISSN (Print): 1478-3363
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 1.6 SJR 0.634 SNIP 1.186
Web of Science (2017): Impact factor 1.526
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.59 SJR 0.676 SNIP 1.292
Web of Science (2016): Impact factor 1.368
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 1.71 SJR 0.68 SNIP 1.278
Web of Science (2015): Impact factor 0.896
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 1.91 SJR 0.586 SNIP 1.241
Web of Science (2014): Impact factor 1.323
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 1.81 SJR 0.598 SNIP 1.441
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 1.27 SJR 0.599 SNIP 1.013
Web of Science (2012): Impact factor 0.894
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 1.12 SJR 0.538 SNIP 0.946
Web of Science (2011): Impact factor 0.589
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.41 SNIP 0.713