Implementation of design rules for perception into a tool for 3D shape generation using a shape grammar and a parametric model

The user experience of a product is recognized as of increasing importance in particular in consumer products. Current approaches to designing user experiences are not easily translated to languages that a computer can understand. This paper examines a particular aspect of user experience, namely perception of the aesthetics of a product, to formalize this to rules which are embedded into a tool to generate design. Investigating the perception of consumers is key for designing for their aesthetic preferences. Previous research has shown that consumers and designers often perceive the same products differently. This paper aims to embed rules on perception into a tool to support designers during design synthesis. Aesthetic design rules connecting perceptions with aesthetic features were integrated into a set grammar and a parametric modelling tool, and applied to the particular case of vases. The generated tool targeted the creation of vases with the perception of beautiful, elegant and exciting. Results show that it is possible to generate beautiful, elegant and exciting vases following the three aesthetic design rules, i.e. tall, simple and curves. The main contribution of this paper is the method used to incorporate information on perception into the set grammar and the parametric model. The tool is additionally proposed for supporting designers during design synthesis of shapes. The results are valid for vases but the method can be applied to other perceptions and product categories.

General information
State: Published
Organisations: Department of Management Engineering, Technology and Innovation Management, Imperial College London, Swiss Federal Institute of Technology Zurich
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Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: Journal of Mechanical Design
Volume: 141
Article number: 011101-1
ISSN (Print): 1050-0472
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): SJR 0.895 SNIP 1.414
Web of Science (2017): Impact factor 2.783
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.47 SJR 0.797 SNIP 1.471
Web of Science (2016): Impact factor 2.565
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 1.48 SJR 1.065 SNIP 1.797
Web of Science (2015): Impact factor 1.444
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.02 SJR 1.415 SNIP 1.915
Web of Science (2014): Impact factor 1.25
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 1.81 SJR 1.226 SNIP 1.736
Web of Science (2013): Impact factor 1.165
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 1.34 SJR 1.122 SNIP 2.095
Web of Science (2012): Impact factor 1.247
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 1.44 SJR 0.858 SNIP 2.093