Exploring representation: A semiotic approach to understanding the image as a carrier of design meaning in a collective design context.

by

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A thesis submitted in fulfilment
of the requirements for the degree of Doctor of Philosophy.

March 2016

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Author's Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

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Acknowledgements

It seems quite usual to record acknowledgements by declaring that there are too many debts to repay. In regards to my supervisors in particular, no truer word can be said. During the course of this dissertation their intellectual loans have been so staggering, that at times I have felt like a stenographer on a cerebral roller coaster, capturing as best I could their guidance and wisdom. A profound debt of gratitude must be extended to my principle supervisor Associate Professor Ning Gu (who deserves much of the credit and none of the blame!). Without his scope of knowledge, this dissertation would not have been possible at all. Indeed the theme of this dissertation was a result of his incredible insight. On a personal note and even more impressive has been his tenacity, guidance and patience, all of which I am sure I have tested on more than one occasion, especially during the times when I genuinely considered this undertaking to be a dark and insurmountable hill. Another debt of gratitude most humbly owed is to the contributions of Professor Michael Ostwald. His coruscating intellect and ability to skilfully advise on an incredible array of fields, all seemingly with ease, would often leave me with nothing but the greatest admiration and also make me green with envy. In short I will always be indebted to the uncompromising intellectual generosity, wisdom, enthusiasm, support and encouragement I have been privileged to receive from both Associate Professor Ning Gu and Professor Michael Ostwald. Without their time and effort, had I been left to my own devices, this dissertation would be little more than a rather abstract set of technical exercises.

A very special thank you must go to Associate Professor Carmel Loughland, who spent valuable personal time helping me organise my thoughts, proof reading and giving continual feedback, and showed dedication to a friendship far beyond anything that could be expected. Some of the ideas in this dissertation must be credited as having stemmed from the many exchanges I have had with my friend Robert Prosser. More often than not these exchanges would occur at lunch on campus and turn a normal lunch break into an extended one. They would always be absolutely invaluable in terms of either fleshing out, or with a well-placed question, rejecting, an idea. Last, but by no means least, a heartfelt recognition must go to my family, Pip, Alex, Amelie, Kay and Bill. A special feeling of gratitude to my loving wife Pip, for all the proof reading whilst simultaneously bearing witness to the brief highs and very long lows over what seemed to stretch far beyond the last four and half years. A very special thank you to my son Alex, who never let me quit nor left my side, and unashamedly believed in what I was doing even when I didn’t. His tenacity still rings in my ears. A whole bunch of thanks to the little girl I know called Amelie, who is the cuddliest and most entertaining girl in the family. Finally words cannot express the depth of my appreciation for Kay and Bill and their unshakable belief that I could do this.

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Glossary of Terms

BIM	Building Information Modelling
CAD	Computer Aided Design
CI	Collective Intelligence
CD	Collective Design
CSCW	Computer Supported Collaborative Work
ODE	Online Design Environment
HREC	Human Research Ethics Committee
Sg	Semiotics in a general context
$Sd^{(1)}$	Semiotics in the first design context
$Sd^{(2)}$	Semiotics in the second design context
HIT	Human Intelligence Tasks
WWW	World Wide Web
VDS	Virtual Design Studios

Abstract

Collective design has been investigated increasingly in the design research community in recent years. Researchers so far have provided conceptual models for design environments and looked to crowdsourcing for insights into motivation, communication and representation. However, with motivation and communication well explored, there is a lack of empirical evidence to support the understanding of how representations might be used in a collective context to convey meaningful design-related content.

This research aims to explore representational use under collective conditions. To achieve this, a study was conducted to compare an expert group of designers in an online design environment (ODE) with a small crowd consisting of 18 participants. Both groups were required to engage with the same design task over a two week open design session in each environment. The ODE was used to collect data during the experiment. By employing a semiotic coding scheme, specifically developed for this study, the collected data was coded and analysed using comparative, and cumulative comparative, analysis methods. The differences were identified through the comparison of experts' and crowd's behaviour in the ODE. From these results, it can be suggested that representation plays an important role in catalysing and supporting design activity in each group, both with unique characteristics within the ODE.

This study reveals that when presented with a design 'problem', and within the collective conditions established for this study, it was observed that human reasoning processes can actively participate as the creative agent in a collective system. In the openly shared collective context of this study the representation was found to be an integral component in the crowd's shared design reasoning processes. These processes consisted of expressed intuition, trains of thought, inquiries, questions and arguments. As such, this study might aid the development of collective mechanisms to support and capture these reasoning processes. Therefore, the outcome of this study may prove beneficial

not only for design educators and design researchers but also for World Wide Web (WWW) and software developers.