UC Merced

Title

Understanding the design neurocognition of industrial designers when designingand problem-solving.

Permalink

https://escholarship.org/uc/item/5g31c8zn

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 41(0)

Authors

Vieira, Sonia
Gero, John
Delmoral, Jessica
et al.

Publication Date

2019

Peer reviewed

Understanding the design neurocognition of industrial designers when designing and problem-solving.

Sonia Vieira

Faculty of Engineering University of Porto, Porto, Porto, Portugal

John Gero

UNCC, Charlotte, North Carolina, United States

Jessica Delmoral

University of Porto, Porto, Portugal

Valentin Gattol

AIT Austrian Institute of Technology GmbH, Vienna, Austria

Carlos Fernandes

University of Porto, Porto, Portugal

Marco Parente

University of Porto, Porto, Portugal

Antnio Fernandes

University of Porto, Porto, Portugal

Abstract

This paper presents results from an experiment to determine brain activation differences between problem-solving and designing of industrial designers. The study adopted and extended the tasks described in a previous fMRI study of design cognition and measured brain activation using EEG. The experiment consists of 4 tasks: problem-solving, basic design and open design tasks using a tangible interface and sketching. By taking advantage of EEG's temporal resolution we focus on time-related neural responses during problem-solving compared to design tasks. Statistical analyses indicate increased activation when designing compared to problem-solving. Results of time-related neural responses connected to Brodmann areas cognitive functions, contribute to a better understanding of industrial designers' cognition. The study is part of a research project whose goal is to correlate design cognition with brain behavior across design domains. Bringing neuroscience methods to design research is contributing to a better understanding of the emergent field of design neurocognition.