

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

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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.