

Designing a Test to Test for Design

Can the modern tools of neuroscience help us observe the cognitive effects of design on interactions with everyday objects?

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Methods

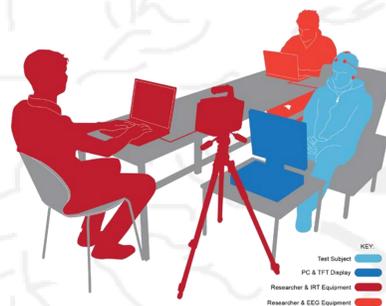
While surveying relevant studies I hope to gain insights into modern methodological trends used to study human interaction with objects. By analyzing the methods I intend to develop a strategy to produce evidence of any effect that design has on our cognition and behavior. I will attempt to modify existing research designs to create my own approach, tailored to address my research question.

Ergonomics

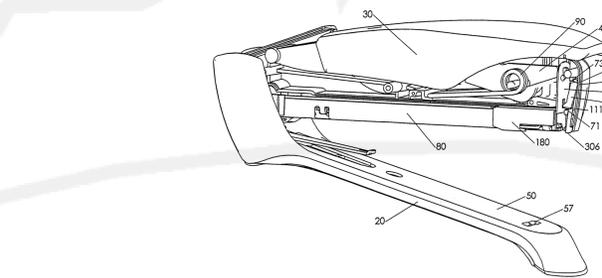
A subtopic of design research is ergonomics. The purpose of ergonomics is to study the interaction of the human form and the designed elements with which one interacts. It is a field that provides its own theories and principles, as well as methods for data collection and analysis.

Affective Self-Report

A self-report can be a questionnaire or interview that seeks to gather feedback about a test subject's experience. In the context of this study, ASR can provide a viable method to measure emotional response.



An example of ASR being used to reinforce an experiment that compares thermographic and EEG imaging during simulated product interactions.



Even a tool as simple as a stapler can possess complex elements of design. Could there be an empirical way to observe any cognitive effects that design could cause during interaction?

Imaging

There are many new technologies that researchers have at their disposal to create images of brain activity. My endeavor is to evaluate the most promising methods and determine which is best suited to observe possible effects that design has on cognition and behavior.

Expected Results

What I expect to achieve from this research is the foundation for a synthesis of interdisciplinary methods to gain insights into the effects, if any, that good design brings to human / device interaction. I expect to use aspects of human behavior studies, brain imaging, and affective self-reporting to design an experiment. This experiment will ideally involve manual manipulation of an object while having pertinent areas of the brain rendered with appropriate imaging technology. An important tool to include will be a post-experiment self report. I believe that a good combination can be achieved that will determine whether good design is an observable factor of human activity.

References

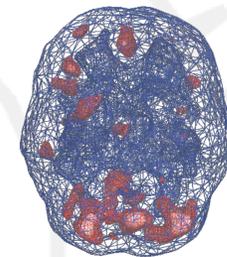
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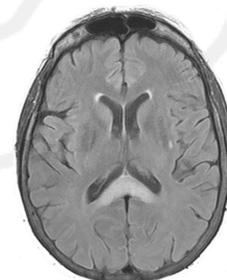
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g.Nautilus®
A wireless, headmounted EEG system with active electrodes available from gtec.at

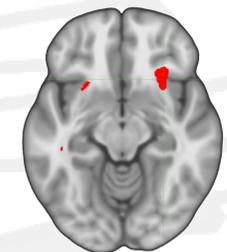
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An award winning example of excellent design for human interaction



Single-photon emission computed tomography (SPECT)
Spect is a nuclear imaging test that uses gamma rays to show how blood flows to tissues and organs
[\[https://peaceorchaos.wordpress.com/category/daniel-amen/\]](https://peaceorchaos.wordpress.com/category/daniel-amen/)



Functional magnetic resonance imagery (fMRI)
An fMRI scan is used to visualize blood flow to an area of the brain via the magnetization difference in O₂ rich versus depleted blood
[\[http://www.mdsabstracts.com/abstract.asp?MeetingID=787&id=100399\]](http://www.mdsabstracts.com/abstract.asp?MeetingID=787&id=100399)



Positron emission tomography (PET)
A PET scan uses radioactive material in the bloodstream to map glucose usage
[\[www.ncbi.nlm.nih.gov/pubmed/23760393\]](http://www.ncbi.nlm.nih.gov/pubmed/23760393)

