Master Thesis

The Impact of Interruptions and Communication on Cognitive Load in Manual Work: An EEG-Based Experimental Study

Introduction

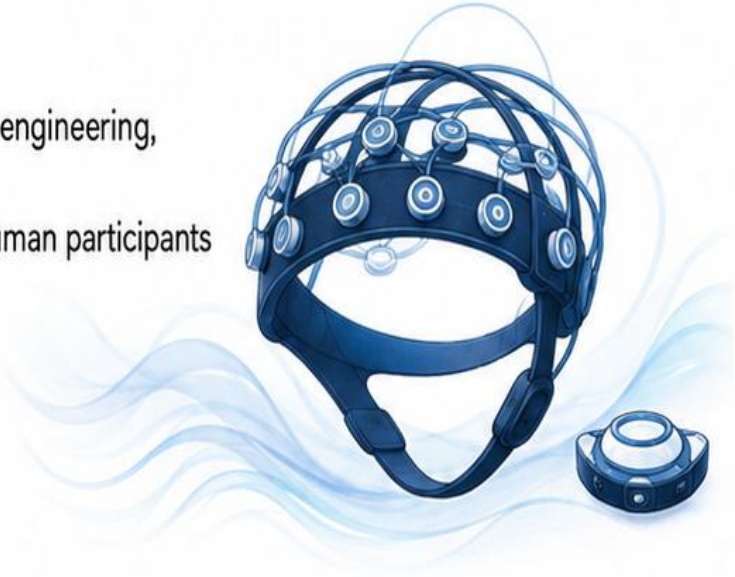
Alongside the physical demands of manual work, the mental demands on assembly and order-picking workers have grown steadily. Interruptions and the constant need to communicate with other parties, a supervisor query, a system alert, or a colleague asking questions, are a frequent yet under-monitored source of cognitive load and human error. Traditionally this mental load is captured only through questionnaires, which are subjective and cannot resolve short events. Electroencephalography (EEG), the recording of the brain's electrical activity at the scalp, offers an objective and continuous alternative. This thesis explores how interruptions and communication shape the cognitive load of manual work, using a lightweight EEG headset.

Tasks

- Familiarise yourself with the relevant literature on interruptions, communication, cognitive load, and EEG-based workload assessment
- Sharpen this broad theme into a focused, answerable research question
- Develop a physical experimental paradigm that replicates a manual order-picking situation in the lab, and decide which conditions and measures best address your question
- Conduct a lab study using the Mindtooth EEG, complemented by established measures such as NASA-TLX (NASA Task Load Index) and task performance/error rates
- Analyse and interpret the data, and reflect on what the results mean for the design of manual work
- Document the approach and findings in a reproducible way

Qualifications

- Master student in mechanical engineering, human factors engineering, psychology, or a comparable field
- Interest in neuroergonomics and experimental work with human participants
- Structured, independent, and reliable way of working
- Basic data-analysis skills (Python, MATLAB, or R)
- Experience with time series analysis or EEG is a plus



Start of the work: Immediately

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