Functional Near Infrared Spectroscopy Workshop

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Abstract / Short description

Functional near-infrared spectroscopy (fNIRS), a noninvasive brain-monitoring technology relies on optical techniques to detect changes of cortical hemodynamic responses to human perceptual, cognitive, and motor functioning, is an increasingly popular neuroergonomics tool.

This workshop is focused on introducing functional near-infrared spectroscopy optical brain monitoring, its physiological and physical principles, data collection and signal processing techniques, as, well as data analysis procedures. There will be both theory lectures as well as hands-on practical sessions. The tutorial is aimed at getting researchers started on fNIRS and is designed for both beginner and intermediate researchers.

Keywords

fNIRS/fMRI, Mobile Brain/Body Imaging, Cognitive Workload, Working Memory, Learning, Brain-Computer Interfaces

Tentative Course Schedule

2-3 hours
Welcome and Introductions
Lectures Part 1   What is fNIRS?
How it works?   (Physical Principles)
What it measures?   (Physiological Principles)
When it measures?   (Experimental paradigms, protocols, and time sync)
Where it measures?   (Functional Neuroanatomy, Spatial co-registration and visualization)
Hands-on workshop / Demonstrations
Data Collection   (Sensor Setup, recording)
Signal processing   (Filtering, Motion artifact rejection, quality control)

Data analysis (Statistics)	
Farewell	

Recommended Reading

1. Yücel, M., Lühmann, A., Scholkmann, F., Gervain, J., Dan, I., Ayaz, H., . . . Wolf, M. (2021). Best practices for fNIRS publications. *Neurophotonics, 8*(1), 012101. doi:10.1117/1.NPh.8.1.012101

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