

Fatih Altindis

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Summary

Motivated research assistant and Ph.D candidate with +5 years experience on designing and conducting EEG experiments. Published and presented conference and research articles about signal analysis of EEG based brain-computer interfaces [1-3]. Studying signal processing techniques for feature extraction of multi-channel EEG signals. Skilled in signal processing techniques especially using MATLAB and Simulink.

Experience

RESEARCH ASSISTANT, ABDULLAH GUL UNIVERSITY, KAYSERI, TURKEY – 2018-PRESENT

- Designed and conducted EEG experiments on more than 80 subjects
- Completed a research project about topological data analysis of EEG signals
- Contributed to research project about measuring cognitive load using EEG signals
- Involving an interdisciplinary project about developing EEG based hand prosthesis
- Managed preparation and grading of homeworks, lab assignments and term projects of electrical engineering courses (Signal and Systems, Digital Design, Electronic Circuit Design, Embedded Systems)

ENGINEER, KORNEA BIOMEDICAL, KAYSERI, TURKEY – 2017-2018

- Developed imaging apparatus to capture micro-sized bubbles in fluid
- Developed MATLAB based image processing algorithm to detect and track motion of micro-sized bubbles
- Proposed and published a study about estimation of fluid pressure from bubble volumes [5]
- Completed TUBITAK entrepreneurship project

Education

Abdullah Gul University, Electrical and Computer Engineering - PhD Candidate, cont.

Abdullah Gul University, Electrical and Computer Engineering - MSc, 2018

Bilkent University, Electrical-Electronic Engineering - BSc, 2016

Publications

- [1] F. Altindis, B. Yilmaz, S. Borisenok and K. Icoz (2021). Parameter Investigation for Topological Data Analysis for EEG Signals. *Biomedical Signal Processing and Control*, 63. doi: 10.1016/j.bspc.2020.102196
- [2] F. Altindis, B. Yilmaz, S. Borisenok and K. Icoz (2018). Use of Topological Data Analysis in Motor Intention Based Brain-Computer Interfaces. *26th European Signal Processing Conference (EUSIPCO)*, Rome, pp. 1695-1699. doi: 10.23919/EUSIPCO.2018.8553382
- [3] F. Altindis and B. Yilmaz (2016). Feature extraction and classification in a two-state brain- computer interface. *Medical Technologies National Congress (TIPTEKNO)*, Antalya, pp. 1-4. doi: 10.1109/TIPTEKNO.2016.7863118
- [4] D. Mutlu-Bayraktar, P. Ozel, F. Altindis, B. Yilmaz (2020). Relationship between objective and subjective cognitive load measurements in multimedia learning. *Interactive Learning Environment*, pp.1-13. doi: 10.1080/10494820.2020.1833042
- [5] F. Altindis, I.T. Ozdur, S.N. Mutlu & B. Yilmaz (2019). Use of laser-induced bubbles in intraocular pressure measurement: a preliminary study. *Laser Physics Letters*, 16, 015601. doi: 10.1088/1612-202X/aaeda6

Projects

Preconditioning of Hand Prosthesis Using Weight Perception - cont

- Designed and conducted EEG experiments
- Preprocessing and artefact removal of EEG signals
- Decoding weight perception from EEG signals using CSP and Riemannian Geometry methods

Measuring Cognitive Load with Eye Tracking and EEG Signals

- Designed and conducted EEG experiments together with eye-tracking glasses
- Preprocessing and artefact removal of recorded EEG signals
- Band power analysis of EEG signals
- Synchronising eye tracking information with EEG signals and extracting features

Topological Data Analysis for Motor Intention Based Brain-Computer Interfaces

- Conducted experiments to gather EEG signals with motor intention
- Topological analysis methods were adapted to real-time analysis of EEG signals
- Test methods were proposed to find out optimal parameters for topological analysis tools

- Robustness of the proposed method against noise and artefact were tested
- Performance comparison between topological data analysis and event-related potential analysis were made

Measuring Intraocular Pressure with Laser-Induced Bubbles

- Experiment setup that imitates intraocular environment was prepared
- Optical adjustments of video recorder were refined
- Automatic detection methodology for laser-induced micro-sized bubbles were developed
- Two different bubble volume estimation methods were proposed
- Correlation between volume of laser-induced bubbles and intraocular pressure was identified

Grants and Scholarships

Entrepreneurship Grant (2021) - TUBITAK 1512 BIGG

Student Award (2021) - BCI Society

Conference Grant (2018) - TUBITAK 2224-A Program

Scholar (2018) - TUBITAK 1512 Entrepreneurship Program

Education Scholarship (2010-2016) - Bilkent University