Zeinab Esmaeilpour
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QUALIFICATION

- Experienced biomedical engineer with a strong research background. Skilled in health technologies, medical devices, biomedical signal processing, physiological recordings and wearables.
  - 5+ years of experience in biological signal processing and data analysis (Hippocampal electrophysiology, EEG, fMRI)
  - 5+ years of experience with MATLAB
  - Thorough familiarity with machine learning (ML) in clustering, classification and regression algorithms with SciKit-Learn, Numpy, pandas and matplotlib libraries in python
  - Experience in human data collection, biomedical sensors and data visualization
  - Great collaborator and team player with excellent communication skills, keen on learning new concepts and picking up new tools

Research Interest

- Biological signal processing, Medical device, Human electrophysiology, Computational modeling

Programming Languages and Technical Skills

- **Languages**: Matlab, Python, R, COMSOL
- **Data Analysis**: Biomedical signal processing, Time-frequency analysis, Machine learning
- **Experimental Neuroscience**: In vitro electrophysiology, EEG, fMRI

Education

- **City College of New York** — New York, NY
  Ph.D. in Biomedical Engineering — *Jan. 2017 – Expected Dec. 2021*
- **Tehran University** — Tehran, Iran
  M.Sc. in Biomedical Engineering — *Sep. 2010 – Sep. 2012*
- **Sharif University of Technology** — Tehran, Iran
  B.Sc. in Electrical Engineering — *Sep. 2005 – Sep. 2009*

Research and Work Experiences

- **City College of New York** — New York, NY
  Research Assistant — *Jan. 2017 – Present*
  - Designed and executed animal and human electrophysiology experiments
  - Used signal processing and statistical models to analyze electrophysiology data using MATLAB/Python
  - Tested and validated electrical stimulation devices for electrophysiological recordings
  - Performed time-series and frequency domain (FFT, STFT) analysis in high dimensional data
  - Performed denoising with minimal information loss using digital filters to enhance signal to noise ratio
  - Conducted two clinical trials on healthy populations using cerebral blood flow imaging (ASL) and behavioral measures
  - Implemented computational neuronal network model to explain modulations observed in hippocampus
  - Led a team of 4 master and undergraduate students to execute a project on modeling human ear including MRI acquisition, implementation of FEM model, writing report docs and publishing a paper in Brain stimulation journal
  - Organized and chaired bi-weekly journal clubs for Brain Stimulation Journal

- **City College of New York** New York, NY
  Visiting research scholar *Jan. 2016 – Dec. 2016*
  - Developed pipelines for predicting responsiveness to brain stimulation using individualized electric field distribution in brain, functional activity (fMRI) and regression algorithm.
- **Amirkabir University of Technology** Tehran, Iran
  Research assistant at Cybernetics Lab *Sep. 2013 – Sep. 2016*
  - Developed Gyri-precise head model based on individualized MRI using finite element modeling (FEM) in COMSOL for a clinical trial on Methamphetamine addiction.
- **Tehran University** Tehran, Iran
  Graduate Research Assistant *Sep. 2010 – Sep. 2012*
  - Analyzed EEG and Auditory Brainstem Response (ABR) signals using time-dependent and Recurrence Quantification Analysis (RQA) and feature selection algorithms.
  - Implemented machine learning (SVM classifier) and analytical statistical analysis in MATLAB to increase classification accuracy of ADHD/ normal children to 98%.

University/College teaching assistant

- Biomedical transducers and instrumentation
- Bioelectric circuits
- Signal processing

Publications

- Z. Esmaeilpour, G. Kronberg et al., "Temporal interference stimulation targets deep brain regions by modulating neural oscillations", *Brain Stimulation, 2020.*
- Z. Esmaeilpour, AD. Shereen et al., "Methodology for tDCS integration with fMRI", *Human Brain Mapping, 2020.*
- N. Gebodh, , Z. Esmaeilpour et al., "Intracranial voltage recording during transcranial direct current stimulation (tDCS) in human subjects with validation of a standard model.", *Brain Stimulation, 2018.*
- Z. Esmaeilpour, M. Milosevic., "Incomplete evidence that increasing current intensity of tDCS boosts outcomes.", *Brain Stimulation, 2018.*
- Z. Esmaeilpour, P. Marangola et al., "Incomplete evidence that increasing current intensity of tDCS boosts outcomes.", *Brain Stimulation, 2018.*
- Bikson, M., B. Paneri, A. Mourdoukoutas, Z. Esmaeilpour et al., "Limited output transcranial electrical stimulation (LOTES-2017): Engineering principles, regulatory statutes, and industry standards for wellness, over-the-counter, or prescription devices with low risk", *Brain Stimulation, 2018.*
- A. Alonzo, Z. Esmaeilpour et al., "Study design and methodology for a multicentre, randomised controlled trial of transcranial direct current stimulation as a treatment for unipolar and bipolar depression.", *Contemporary clinical trials, 2016.*
- Z. Esmaeilpour, A. M. Nasrabadi et al., "An auditory brainstem response-based expert system for ADHD diagnosis using recurrence qualification analysis and wavelet support vector machine.", *2015 23rd Iranian Conference on, IEEE, 2015.*

Honors and awards

Recipient of the **Wallace H.Coulter Award** for outstanding graduate research performance in biomedical engineering by Ph.D student, 2020.
Recipient of the **poster prize** in Annual meeting of DGKN 2020, German society for clinical neurophysiology and functional imaging.
Recipient of GHC 20 **(Grace Hopper Celebration Conference 2020)** Student Scholarships.
Recipient of the **young investigator award** in NYC neuromodulation conference & NANS for outstanding research.

Professional Activities

Reviewer for Cortex, iScience, Neuroimage, Brain stimulation, Frontiers.
Organizer of journal club series for a leading journal (Brain Stimulation journal, impact factor: 8.9).
Invited talk at Bernstein conference, "Frequency preference response to external perturbation", Berlin, Germany, 2021.
Panelist in Diversity in Neuromodulation session,"How enhancing representation enhances the science and technology", NANS conference, Napa,California, 2019.
Conference presentation at society for neuroscience, "Amplitude-Modulated High-Frequency Electric Field Stimulation of Hippocampal Gamma Oscillations in vitro", Chicago, 2019,