Amirreza Bahramani

+98 9128509635 | bahramani.github.io
bahramani77@gmail.com | bahramani@ipm.ir
linkedin.com/in/amirreza-bahramani | github.com/bahramani

Education

Master of Science | ***Electrical Engineering / Micro and Nanoelectronics Devices*** Sep. 2022 – Present
Sharif University of Technology, GPA: 15.36/20 Tehran, Iran

- **Thesis**: Vocal Perception in Zebra Finches: Analysis of Measured Neural Responses to Variety of Auditory Stimuli Using Neural Probe
- **Supervisors**: Dr. Ali Ghazizadeh and Dr. Mehdi Fardmanesh

Bachelor of Science | ***Electrical Engineering*** Sep. 2017 – Feb. 2022
K. N. Toosi University of Technology, GPA: 15.54/20 Tehran, Iran

- **Thesis**: Design and Implementation of a Fully-Digital Neuromorphic Processor (Link)
- **Supervisor**: Dr. Amir M. Sodagar

Work Experience

Researcher Sep. 2022 – Present
Birds' Lab, Institute for Research in Fundamental Sciences (IPM) Tehran, Iran

- **Neuroscience**; Trying to investigate the neural mechanism of vocal perception in zebra finches through electrophysiology and behavioral experiments.
- **Electrophysiology**; Performing surgery on zebra finches in order to record neural activity.
- **Data Analysis**; Using different techniques on spiking data and LFP, obtained from zebra finches.

Research Assistant Feb. 2022 – Sep. 2022
Birds' Lab, Institute for Research in Fundamental Sciences (IPM) Tehran, Iran

- Setting up the electrophysiology recording system for single-unit and LFP recording in zebra finches.
- Mastering avian surgery needed for neural data acquisition.
- Implementing costume software for online spike detection and processing using MATLAB.

Internship Jul. 2021 – Feb. 2022
Research Laboratory for Integrated Circuits and Systems (ICAS), K. N. Toosi University of Technology Tehran, Iran

- Utilizing Spiking Neural Networks in Python for English handwritten digit recognition.

Research Interests

- Systems Neuroscience
- Computational Neuroscience
- Neurobiology of Decision-Making
- Neurobiology of Vocal Learning
- Neuroethology of Birdsong
- Spiking Neural Networks

Teaching Experience

Neuroscience Teacher (Link to Materials) *Amir High School*
Teaching fundamentals of systems neuroscience to students. Oct. 2023 – Present

Teaching Assistant *K. N. Toosi University of Technology*
Electronics 2 by Dr. Hesam Zandi Sep. 2021 – Jan. 2022

Teaching Assistant *K. N. Toosi University of Technology*
Digital Systems 1 by Dr. Hesam Zandi Feb. 2021 – Jul. 2021

Teaching Assistant *K. N. Toosi University of Technology*
Electronics 1 by Dr. Hesam Zandi Sep. 2020 – Feb. 2021

Teaching Assistant *K. N. Toosi University of Technology*
Electric Circuits 1 by Dr. Ali A. Razi-Kazemi Feb. 2020 – Jul. 2020

Selected Projects

Surgery Protocol for Acute Recording in Anesthetized Zebra Finches | ***Protocol*** — Fall 2023
Birds' Lab, IPM — Protocol Link

- Detailed protocol needed for the surgery of anesthetized zebra finches to record neural activity.

Neural Data Analysis from Auditory Areas | ***MATLAB*** — Summer 2023
Birds' Lab, IPM — GitHub Link

- Here are some codes for analysis of recorded LFP and spiking data from zebra finches' auditory areas.

Stimulus Presentation Effect on Neural Variability | ***MATLAB*** — Spring 2023
Advanced Topics in Neuroscience Course, Sharif University — GitHub Link

- As the final project of this course, I investigated the effect of stimulus presentation on neural variability in different datasets.

Visual Modeling and Sparse Representation | ***MATLAB*** — Jul. 2023
Advanced Topics in Neuroscience Course, Sharif University

- Building basis functions like V1 from different datasets.

Modeling Evidence Accumulation | ***MATLAB*** — Jun. 2023
Advanced Topics in Neuroscience Course, Sharif University

- Basic models of evidence accumulation and decision-making have been implemented.

LFP Analysis and Traveling Wave | ***MATLAB*** — May 2022
Advanced Topics in Neuroscience Course, Sharif University — GitHub Link

- Investigation of the properties of LFP signals and the traveling waves within them.

Analysis of Area 7a Population Response | ***MATLAB*** — Apr. 2022
Advanced Topics in Neuroscience Course, Sharif University — GitHub Link

- Analyzing single-unit and population response of area 7a neurons in a motor task.

Modeling the Irregularity of Neuronal Activity | ***MATLAB*** — Feb. 2022
Advanced Topics in Neuroscience Course, Sharif University — GitHub Link

- Analyzing simulated spike trains and their statistics.

Skills

Languages: English, Farsi (Native)
Wet Lab Skills: Electrophysiology, Avian Neurosurgery
Programming: MATLAB, Python, R, C++
Software Packages: Plexon Offline Sorter, Scikit-learn, TensorFlow, PyTorch, EEGLAB, Brainstorm, Brian2
Simulators: PSpise, HSpice, Proteus
Hardware Discription Languages (HDL): VHDL, Verilog
Document Creation: Microsoft Office Suite, LaTeX

Honors and Awards

Best Poster Award at Sharif University, School of Electrical Engineering — Dec. 2023
Selected as one of the four best posters based on my master's thesis. — Download Here

Best Paper Award at Iranian Conference on Biomedical Engineering (ICBME 2023) — Dec. 2023
For the "*Fabrication of a Low-Cost Multi-Electrode Neural Probe for Brain Signal Recording*" paper. — Link to Paper

Iranian Graduate National Entrance Exam in Electrical Engineering — Summer 2022
Ranked 115 among 10k participants.

Best Internship Award at K. N. Toosi University of Technology — Dec. 2021
My internship was at ICAS lab, on neuromorphic computing which led to my bachelor's thesis.

Iranian Undergraduate National Entrance Exam in Math and Physics (Konkour) — Summer 2017
Among 1% top students in total of 150k participants.

Selected Courses

Computational Neuroscience Summer School — *Neuromatch Academy*
Certification Link

Deep Learning Summer School — *Neuromatch Academy*
Certification Link

Computational and Systems Neuroscience School — *Sharif University and IPM*
by Many Instructors

Advanced Topics in Neuroscience — *Sharif University*
by Dr. Ali Ghazizadeh

Fabrication of Solid-State Devices — *Sharif University*
by Dr. Bizhan Rashidian

Advanced Solid-State Devices — *Sharif University*
by Dr. Bizhan Rashidian

Neurobiology of Decision-Making — *IPM*
by Dr. Mehdi Sanayei

Neurophysiology and Neuroanatomy — *IPM*
by Dr. Mehdi Sanayei

Implantable Biomedical Systems — *K. N. Toosi University of Technology*
by Dr. Amir M. Sodagar — Course Description

Statistical Pattern Recognition — *K. N. Toosi University of Technology*
by Dr. Hamid Abrishami Moghaddam

Functional Brain Imaging Systems — *K. N. Toosi University of Technology*
by Dr. Ali Khadem

EEG Signal Recording and Signal Processing Workshop — *National Brain Mapping Laboratory*
by Dr. Ali Motie Nasrabadi

Principle of Experiment Design and Analysis — *Sharif University*
Dr. Jamal Amani Rad