

Amirreza Bahramani

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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
 - Supervisor: Dr. Amir M. Sodagar

WORK EXPERIENCE

- Researcher** Sep. 2022 – Present
Bird's 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 single-unit activity.
 - Data Analysis; Using different techniques on LFP and spiking data obtained from zebra finches.
- Research Assistant** Feb. 2022 – Sep. 2022
Bird's Lab, Institute for Research in Fundamental Sciences (IPM) Tehran, Iran
- Setting up the electrophysiology recording system for single-unit 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)** *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

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|--|---|
| Surgery Protocol for Electrophysiological Recording in Zebra Finches <i>Protocol</i> <i>Birds' Lab, IPM</i> <ul style="list-style-type: none">Detailed protocol needed for the surgery of anesthetized zebra finches in order to record neural activity from them. | Fall 2023 Protocols Link |
| Neural Data Analysis from Auditory Areas <i>MATLAB</i> <i>Birds' Lab, IPM</i> <ul style="list-style-type: none">Here are some codes for analysis of recorded LFP and spiking data from zebra finches' auditory areas. | Summer 2023 GitHub Link |
| Stimulus Presentation Effect on Neural Variability <i>MATLAB</i> <i>Advanced Topics in Neuroscience Course, Sharif University</i> <ul style="list-style-type: none">As the final project of this course, I investigated the effect of stimulus presentation on neural variability in different datasets. | Spring 2023 GitHub Link |
| Visual Modeling and Sparse Representation <i>MATLAB</i> <i>Advanced Topics in Neuroscience Course, Sharif University</i> <ul style="list-style-type: none">Building basis functions like V1 from different datasets. | Jul. 2023 |
| Learning to Predict Where Human Look <i>MATLAB</i> <i>Advanced Topics in Neuroscience Course, Sharif University</i> <ul style="list-style-type: none">Comparison of different saliency maps, produced by previously established algorithms. | Jun. 2023 |
| Modeling Evidence Accumulation <i>MATLAB</i> <i>Advanced Topics in Neuroscience Course, Sharif University</i> <ul style="list-style-type: none">Basic models of evidence accumulation and decision-making have been implemented. | Jun. 2023 |
| LFP Analysis and Traveling Wave <i>MATLAB</i> <i>Advanced Topics in Neuroscience Course, Sharif University</i> <ul style="list-style-type: none">Investigation of the properties of LFP signals and the traveling waves within them. | May 2022 GitHub Link |
| Analysis of Area 7a Population Response <i>MATLAB</i> <i>Advanced Topics in Neuroscience Course, Sharif University</i> <ul style="list-style-type: none">Analyzing single-unit and population response of area 7a neurons in a motor task. | Apr. 2022 GitHub Link |
| Modeling the Irregularity of Neuronal Activity <i>MATLAB</i> <i>Advanced Topics in Neuroscience Course, Sharif University</i> <ul style="list-style-type: none">Analyzing simulated spike trains and their statistics. | Feb. 2022 GitHub Link |

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: PSpice, HSpice, Proteus
Hardware Discription Languages (HDL): VHDL, Verilog
Document Creation: Microsoft Office Suite, \LaTeX

HONORS AND AWARDS

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|---|-------------|
| Iranian Undergraduate National Entrance Exam in Math and Physics (Konkour) Among 1% top students in total of 150k participants. | Summer 2017 |
| Iranian Graduate National Entrance Exam in Electrical Engineering Ranked 115 among 10k participants. | Summer 2022 |

SELECTED COURSES

Computational Neuroscience Summer School

Certification Link

Neuromatch Academy

Deep Learning Summer School

Certification Link

Neuromatch Academy

Computational and Systems Neuroscience School

by Many Instructors

Sharif University and IPM

Advanced Topics in Neuroscience

by Dr. Ali Ghazizadeh

Sharif University

Advanced Solid-State Devices

by Dr. Bizhan Rashidian

Sharif University

Neurobiology of Decision-Making

by Dr. Mehdi Sanayei

IPM

Neurophysiology and Neuroanatomy

by Dr. Mehdi Sanayei

IPM

Implantable Biomedical Systems

by Dr. Amir M. Sodagar

K. N. Toosi University of Technology
Course Description

Statistical Pattern Recognition

by Dr. Hamid Abrishami Moghaddam

K. N. Toosi University of Technology

Functional Brain Imaging Systems

by Dr. Ali Khadem

K. N. Toosi University of Technology

EEG Signal Recording and Signal Processing Workshop

by Dr. Ali Motie Nasrabadi

National Brain Mapping Laboratory

Principle of Experiment Design and Analysis

Dr. Jamal Amani Rad

Sharif University