

Hamed Shabani

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Research Experience

- Jan 2022 **Postdoctoral Researcher**, *Bernstein Center*, University of Freiburg .
○ Research in the field of Computational Neuroscience
- Project Developed an automated system for detecting burst sequences in mouse prefrontal cortex using calcium imaging data.
- Oct 2019 **Visiting Scientist**, *University of New South Wales*, Sydney.
Project Compared patch-clamp data with extracellular responses of retina ganglion cells to electrical stimulation.
- 2015–2017 **Research Assistant**, *Brain Engineering Center (IPM)*, Tehran.
○ Project 1: Response variability in visual cortex.
○ Project 2: Detecting expression of the architectural window shapes with EEG data.
- Tasks Analyzed human EEG and e-phys data recorded from non-human primates.

Education

- 2017–2021 **Ph.D. in Neuroscience**, *University of Tübingen*.
Dissertation *Development of a New Stimulation Strategy for Retinal Implants*.
Supervisors Dr. Daniel Rathbun, Prof. Eberhard Zrenner (Collaboration with UNSW, Sydney)
Tasks Planned and executed in-vitro experiments on retina tissue.
- 2013–2016 **M.S. in Biomedical Engineering**, *Shahed University*, Tehran.
Dissertation *Development of a Drowsiness Detection System Using EEG Signals*.
Supervisor Dr. Mohammad Mikaili
Tasks Conducted experiments to collect and analyze EEG data from human subjects.
- 2009–2011 **B.S. in Electrical Engineering**, *Bahonar Technical College of Shiraz*.
Project *Development of a MATLAB-Compatible Electrocardiogram (ECG) System*.
Tasks Designed and constructed electronic circuits.

Mentorship Experience

- SS 2020 Mentored Master's students at HTWK Leipzig in the Pattern Recognition course.
- SS 2019 Mentored Master's students in the Implantology course at the University of Tübingen.

Workshops and Abstracts

- Aug 1-14, 2024 **Workshop**, GeneTechX Intensive Workshop, BioLab Heidelberg.
- Aug 2-21, 2021 **Summer School**, NeuroMatch Academy Deep Learning course.
- Oct 12-14, 2020 **Workshop**, UCL Neuropixels Course.
- March 13, 2019 **Workshop**, Research Funding and Grant Writing, DZNE Tübingen.
- Dec 28, 2016 **Workshop**, Spike data analysis, Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
- Oct 4, 2021 **Platform Presentation**, Characterizing Electrical Response Properties of Retinal Ganglion Cells using Gaussian Noise Stimulus. *The Eye and the Chip conference*, Detroit, Michigan.

April 27, 2019 **Poster Presentation**, Multi-Electrode Recording for Classification of Retinal Ganglion Cells for Bionic Vision, Shabani H, Sadeghi M, Hosseinzadeh Z Zrenner E Rathbun D. *Arvo Conference*, Vancouver, Canada (Travel grant).

Skills and Interests

Programming Python, Matlab, C.

Lab Skills Proficient in retina surgery and in-vitro electrophysiology, with hands-on experience in cell culture, CRISPR, FACS, fluorescence microscopy, and PCR techniques.

Data Analysis Proficient in data analysis and applying machine learning techniques to interpret and model data.

Instrumentation Knowledgeable in designing and building custom electronic circuits for experimental setups. Experienced in sensor integration, data acquisition systems, and signal processing techniques.

Lab Management Proficient in lab organization, equipment maintenance, and inventory management. Skilled in coordinating research activities, training new lab members, and ensuring compliance with safety protocols.

Interests Neural Organoids: Fascinated by the development and application of neural organoids for studying neural circuitry and disease modeling.

Lab-on-chip: Intrigued by the potential of retina-on-chip technologies for modeling retinal function and disease mechanisms in vitro.

Gene Editing, Synthetic Biology, Drug Discovery.

Languages

English (Fluent), German (B2), Persian (native).

Publications

- [1] **Shabani,H**, Zrenner E, Rathbun D, and Hosseinzadeh Z. Electrical Input Filters of Ganglion Cells in Wild Type and Degenerating rd10 Mouse Retina as a Template for Selective Electrical Stimulation. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, pages 1–1, 2024.
- [2] Jacqueline Reinhard, Cornelius Mueller-Buehl, Susanne Wiemann, Lars Roll, Veronika Luft, **Shabani H**, Daniel L Rathbun, Lin Gan, Chao-Chung Kuo, Julia Franzen, et al. Neural extracellular matrix regulates visual sensory motor integration. *Isience*, 27(2), 2024.
- [3] **Shabani,H**, Zrenner E, Rathbun D, and Hosseinzadeh Z. Classification of pseudocalcium visual responses from mouse retinal ganglion cells. *Visual Neuroscience*, 38, 2021.
- [4] Naghibi Rad P, Shahroudi AA, **Shabani H**, and Lashgari R. Encoding pleasant and unpleasant expression of the architectural window shapes: An ERP study. *Frontiers in Behavioral Neuroscience*, 13:186, 2019.
- [5] Rathbun DL, Ghorbani N, **Shabani H**, Zrenner E, and Hosseinzadeh Z. Spike-triggered average electrical stimuli as input filters for bionic vision—a perspective. *Journal of Neural Engineering*, 15(6):063002, 2018.
- [6] **Shabani H**, Mikaili M, and Noori SMR. Assessment of recurrence quantification analysis (RQA) of EEG for development of a novel drowsiness detection system. *Biomedical Engineering Letters*, 6(3):196–204, 2016.

References

Prof. Eberhart Zrenner

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Dr. Mohit shivdasani

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Links

Webpage

- <http://hamedshabani.github.io>

Twitter

- twitter.com/hamedsh91

Google scholar

- Google Scholar