

# Hamed Shabani

Researcher at the Bernstein Center Freiburg.

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<http://hamedshabani.github.io>



## 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.

## Research Experience

Jan 2022 **Postdoctoral Researcher**, *Bernstein Center*, University of Freiburg .

Project Developing 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 Comparing 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.

## 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 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.

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, in-vitro electrophysiology, and neural stimulation 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.
Data Analysis	Experienced in neuronal data analysis and visualization using machine learning techniques.
Instrumentation	Knowledgeable in designing and building custom electronic circuits for experimental setups. Experienced in sensor integration, data acquisition systems, and signal processing techniques.
Interests	Neural Organoids: Fascinated by the development and application of neural organoids for studying neural circuitry and disease modeling.  Retina-on-chip: Intrigued by the potential of retina-on-chip technologies for modeling retinal function and disease mechanisms in vitro.

## Languages

English, 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. *Iscience*, 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

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**Dr. Mohit shivdasani**  
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**Dr.Zohreh Hosseinzadeh**  
o University of Leipzig  
o Zohreh.Hosseinzadeh@medizin.uni-leipzig.de

## Links

**Webpage**  
o <http://hamedshabani.github.io>

**Twitter**  
o [twitter.com/hamedsh91](https://twitter.com/hamedsh91)

**Google scholar**  
o [https://scholar.google.nl/citations?hl=enuser=L5IEAcIAAAAJd=gs\\_hdr\\_drw](https://scholar.google.nl/citations?hl=enuser=L5IEAcIAAAAJd=gs_hdr_drw)