Murat Can MUTLU, PhD

Phone: +49 17672491042
E-mail: murat.mutlu@ovgu.de
murat.mutlu@boun.edu.tr
muratcanmutlu@gmx.de

39108, Magdeburg, Germany

Education

Feb. 2012 – Aug. 2021 **Ph.D. in Biomedical Engineering**
Institute of Biomedical Engineering,
Boğaziçi University, İstanbul, TR

Sep. 2010 – Nov. 2011 **M.Sc. in Bioengineering**
Department of Bioengineering,
Imperial College London, London, UK

Sep. 2006 – Jun. 2010 **B.Sc. in Electronics Engineering**
Electrical and Electronic Engineering Faculty,
Istanbul Technical University, İstanbul, TR

Work Experiences

Apr. 2021 – Nov. 2023 **Postdoctoral Researcher at the Institute of Biology**, **Otto-von-Guericke University**
- Collected and analyzed fMRI data (multistable perception paradigm)
- Analyzed EEG data (resting state connectivity)
- Supervised tutorials of Theoretical Neuroscience I & II (in MATLAB)

Sep. 2020 – Feb. 2021 **Lecturer at Bahçeşehir University**
- Introduction to Programming (M.Sc. course in Neuropsychology program)

Sep. 2018 – Feb. 2021 **Lecturer at Medipol University**
- Introduction to C Programming
- Medical Imaging

Sep. 2018 – Feb. 2021 **Lecturer at Acıbadem University**
- Electronics I - II
- Medical Electronics
- EEG Applications
- EMG Applications
- Physiological Signal Processing

Oct. 2012 - Sep. 2018 **Research Assistant at Institute of Biomedical Engineering, Bogaziçi University**
- Carried out EEG laboratory lectures with postgraduate students
- Carried out in-vitro whole cell patch clamp on rodent
- Supervised several M.Sc. students at Cellular Imaging and Electrophysiology Lab
- Repaired and maintenaned of various equipments at the Institute
- Wrote several projects

Feb. 2013 – May 2013 **Visiting Researcher at Imperial College London**

- Participated in 2-photon in vitro calcium imaging on mice.
- Developed algorithm to automatically detect calcium transients of neurons from 2-photon images/videos.

Apr. 2008 – Sep. 2008 **Software Developer at Software Department, ARSKOM Group, İstanbul**

- Developed firewall and established VOIP within the company in UBUNTU.

Projects

Nov. 2018 – Nov. 2019 **Investigating the Lateralized Effects of Language and Visual Processing Tasks on Brain with Ear Temperature and fNIRS**

- Bogazici University Research Fund, Grant Number 14663
- Part of my PhD thesis

May 2014 – Aug. 2021 **Investigation Brain Energy Dynamics During Language Activity** (Ph.D. Thesis)

- Investigated brain energy dynamics during auditory processing of Turkish-English interlingual homophone words with
  - ear temperature measurement that reflects the ongoing neural activity in the ipsilateral hemisphere
  - fNIRS to capture the hemodynamic activity in the prefrontal cortex
- Investigated brain energy dynamics during a visual discrimination/recognition task with
  - ear temperature measurement that reflects the ongoing neural activity in the ipsilateral hemisphere
  - fNIRS to capture the hemodynamic activity in the prefrontal cortex
- Investigated hemodynmic activity in the prefrontal cortex with fNIRS during
  - novel 2D mental rotation task
  - visually presented relative clause processing in Turkish
- Developed n infrared ear thermometer system with sampling rate of 100 Hz and resolution of 0.01° C

Jan. 2011 – Sep. 2011 **Developing a Stand-Alone Experimental Setup for Neurophysilogy Experiments in Behaving Mice** (M.Sc. Thesis)

- Developed a stand-alone experiment rig that includes a reward system (i.e., juice delivery for successful trials) and punishment system (i.e., air puff and high pitch noise for unsucessful trials) along with extensive OpenGL coding to generate a wrapped visual stimuli suitable for the inner surface of a 270° dome to generate a virutal reality environment for the animal.

Jan. 2010 – Sep. 2010 **Electrooculography (EOG) based Computer Mouse Control** (B.Sc. Thesis)

- Developed an electrooculogram based virtual keyboard in MATLAB that can be controlled with eye movements.

Publications

Peer-Reviewed Journal Articles

- Mutlu, M.C., Canbeyli, R., & Saybaşılı, H. (2023) **Auditory Processing of Interlingual Homophones: an fNIRS Investigation,** Language, Cognition and Neuroscience, 38:8, 1153-1166, doi: 10.1080/23273798.2023.2213785

- Mutlu, M. C., Canbeyli, R., & Saybaşılı, H. (2023). **fNIRS Shows that Object Relative Clauses are More Difficult to Process than Subject Relative Clauses in Turkish.** European Journal of Neuroscience, 57 (6), 951-961. doi: 10.1111/ejn.15930

- Mutlu, M.C., Erdoğan, S.B., Öztürk, O.C., Canbeyli, R., & Saybaşılı, H. (2020). **Functional Near-Infrared Spectroscopy Indicates that Asymmetric Right Hemispheric Activation in Mental Rotation of a Jigsaw Puzzle Decreases with Task Difficulty.** Front. Hum. Neurosci. 14:252. doi: 10.3389/fnhum.2020.00252

Preprints

- Szakacs, M.H., Mutlu, M.C., Balestrieri, G., Gombos, F., Braun, J., Kringelbach, M.L., Deco, G. & Kovacs, I. (2023) **Navigating Pubertal Goldilocks: The Optimal Pace for Hierarchial Brain Organization,** bioRxiv. doi: 10.1101/2023.08.30.555584

Conference Abstracts and Papers

- Mutlu, M.C., Kakaei, E., Braun, J. (2022). **Candidate areas for initiating spontaneous reversals of kinetic depth - inferior frontal cortex and insula.** Bernstein Conference 2022. doi: 10.12751/nncn.bc2022.208

- Mutlu, M., Canbeyli, R., and Saybaşılı, H. (2018). **Görsel işleme deneyinin sonucu olarak lateralize kulak sıcaklığı artışı** *(Lateralized ear temperature increase as a result of visual processing*). 16th National Neuroscience Congress, İstanbul, May 20-23, 2018.

- Mutlu, M. C., Tanal, N. D., Dag, O., Canbeyli R., and Saybasili, H. (2017). **Auditory linguistic stimuli causes lateralized physiological and haemodynamic responses in brain**. Anatomy, Volume 11, Suppl 1. May 2017.

- Mutlu, M., Kaplan, E., Sen, U., Eren, K., Ertas, G., Saybasili, H., and Canbeyli, R. (2015). **Lateralized Tympanic Membrane Temperature Responses to Listening to Words**. EBBS-EBPS 2015 Joint Meeting, Verona, Italy, September 12-15, 2015.

- Agabi, O., Marchand, P., Mutlu, M., Klotz, L., and Schultz, S. R. (2013). **Calcium imaging in temporal focus**. Proceedings of the 6th International IEEE/EMBS Conference on Neural Engineering, San Diego, November 2013, pp. 1525-28.

- Mutlu, M. C., Agabi, O., Zhang, Y., Dragotti, P. L., and Schultz, S. R. (2013). **Large-scale automated analysis of neuronal calcium transients.** 11th National Neuroscience Congress, İzmir, April 28 – May 1 2013.

- Muzzu, T., Faisal, A.A., Mutlu, M., and Schultz, S.R. (2013**). The MusoDrome: an open-source VR platform for studying sensorimotor learning in mic**e. British Neuroscience Association, London, 2013.

- Berdichevskaia, A., Houston, C., Mutlu, M., Wisden, W., and Schultz, S.R. (2012). **Investigation of the role of mPFC in visually guided behaviour by optogenetic disruption of function.** Program No. 610.11. 2012 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience. Online

- Muzzu, T., Faisal, A.A., Mutlu, M., and Schultz, S.R. (2012). **The MusoDrome: an open-source VR platform for studying sensorimotor learning in mice.** Program No. 79.05. 2012 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience. Online

Research Interest

- Neurolinguistics
- Multistable Perception
- Neurosignal analysis: - fNIRS, fMRI, EEG
- Brain Dynamics and Connectivity
- Altered state of consciousness

Skills

- **Computer and Software**
  - Windows & Linux
  - MATLAB, C, Python
  - EEGLAB, Homer 2 & 3
  - Psychopy
  - SPSS
  - FreeSurfer, FSL
  - NIRX Softwares (nirsLAB, NIRSite, etc.)
- **Language**
  - Turkish (Mother Tongue)
  - English (Proficient)
  - German (Intermediate)

Scholarships

Sep. 2008 – Jun. 2010 **Siemens Scholarship**

- Supported during undergraduate study.