

MEHMET KEREM TURKCAN

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EDUCATION

- ◊ **Columbia University**, United States January 2017 – October 2022 (Expected)
 - Ph.D. in Electrical Engineering, Research Area: Systems Biology and Neuroengineering
 - Cumulative GPA: 4.10
 - *Relevant Coursework*: Systems Biology: Design Principles for Biological Circuits, Sparse Representation and High-Dimensional Geometry, Introduction to Genomic Information Science and Technology, Foundations of Graphical Models, Autonomous Multi-Agent Systems, Neural Control Engineering
- ◊ **Columbia University**, United States September 2015 – December 2016
 - M.Sc. in Computer Science, Machine Learning/Thesis Track
 - Cumulative GPA: 3.97
 - *Relevant Coursework*: Advanced Machine Learning, Bayesian Methods in Machine Learning, Neural Networks and Deep Learning, Introduction to Computational Learning Theory, Computer Graphics, Programming Languages and Translators, Analysis of Algorithms I
- ◊ **Istanbul Technical University**, Turkey 2011 – 2015
 - B.Sc. in Electronics and Communication Engineering
 - Cumulative GPA: 3.75
 - *Relevant Coursework*: Image Processing, Wireless Communication Networks, Data Communications, Digital Signal Processing Design and Applications, Advanced Physics Project Laboratory

TEACHING

- ◊ *Course Assistant*, Columbia University Spring 2020/Spring 2021
 - **ECBM E4070: Computing with Brain Circuits of Model Organisms**
- ◊ *Teaching Assistant*, Columbia University Spring 2018
 - **ECBM E6070: Fruit Fly Brain as a Neuroinformation Processor**
- ◊ *Teaching Assistant*, Columbia University Fall 2017
 - **BMEB W4020: Computational Neuroscience: Circuits in the Brain**
- ◊ *Course Assistant*, Columbia University Fall 2016
 - **ECBM E4040: Neural Networks and Deep Learning**

TALKS&LECTURES

- ◊ *Visualization and Exploration of the Fly Brain Datasets with NeuroNLP++*, Neuromatch 4.0 December 2021
 - Adapting Modern NLP Workflows for Domain-Specific Q&A and Connectome Dataset Exploration
- ◊ *FlyBrainLab: An Interactive Open Computing Platform*, PyData Global November 2020
 - FlyBrainLab as a Platform for Centralizing Computational Research on Drosophila Neural Circuits
- ◊ *Drosophila Neurobiology: Genes, Circuits&Behavior*, Cold Spring Harbor Laboratory July 2018
 - Building the Functional Map of the Fruit Fly Brain

PUBLICATIONS

- ◊ PREPRINTS
 - **A Programmable Ontology Encompassing the Functional Logic of the Drosophila Brain**
An integrated ontological search platform and library for connectome-realistic simulation and interrogation of the function of large-scale spiking neural circuits on GPUs, taking into account the input space and the biologically relevant cell-types
Aurel A. Lazar*, Mehmet K. Turkcan*, Yiyin Zhou* (*: Alphabetical Order)
 - **The Fruit Fly Brain Observatory: From Structure to Function**
The next generation open-source platform to support open, collaborative Drosophila neuroscience research.
Nikul H. Ukani, Chung-Heng Yeh, Adam Tomkins, Yiyin Zhou, Dorian Florescu, Carlos Luna Ortiz, Yu-Chi Huang, Cheng-Te Wang, Mehmet K. Turkcan, Tingkai Liu, Paul Richmond, Chung-Chuan Lo, Daniel Coca, Ann-Shyn Chiang, Aurel A. Lazar

- **Using an Ancillary Neural Network to Capture Weekends and Holidays in an Adjoint Neural Network Architecture for Intelligent Building Management**
Capture uncertainty and inject extra information for forecasting for intelligent building management.
Zhicheng Ding, Mehmet K. Turkcan, Albert Boulanger
- ◇ PUBLISHED
- **FlyBrainLab: Accelerating the Discovery of the Functional Logic of the Drosophila Brain in the Connectomic/Synaptic Era**
eLife, 2021.
An interactive computing platform to accelerate the understanding of the functional logic of the fly brain.
Aurel A. Lazar*, Tingkai Liu*, Mehmet K. Turkcan*, Yiyin Zhou* (*: Alphabetical Order)
- **Visualization and Graph Exploration of the Fruit Fly Brain Datasets with NeuroNLP++**
Neuromatch 4.0, December 1-2, 2021, Online.
An application that utilizes modern advances in NLP and uses users' queries to retrieve and visualize neurons in a connectomics dataset as well as the relevant terms in a brain ontology.
Aurel A. Lazar*, Mehmet K. Turkcan*, Yiyin Zhou* (*: Alphabetical Order)
- **Untangling the Graph Structure of Drosophila Brain Datasets with Open Source FlyBrainLab Utility Libraries**
Society of Neuroscience, November 8-11, 2021, Online.
A set of open source utility libraries written in Python to facilitate the exploration of the graph structure of fruit fly brain circuits from raw, large-scale connectomics and synaptomics datasets.
Aurel A. Lazar*, Mehmet K. Turkcan*, Yiyin Zhou* (*: Alphabetical Order)
- **Interrogating the Functional Logic of Drosophila Brain Circuits at Single-Synapse Scale**
Society of Neuroscience, November 8-11, 2021, Online.
We seek to shift the modeling emphasis in connectome simulations from communicating neurons to the interactions between blocks of synapses.
Aurel A. Lazar*, Mehmet K. Turkcan*, Yiyin Zhou* (*: Alphabetical Order)
- **NeuroNLP Gene Match—An open source genetic data visualizer and explorer**
Neurobiology of Drosophila, 2021.
A 3D environment for jointly exploring the morphology, connectome, synaptome and gene expression datasets.
Aurel A. Lazar*, Mehmet K. Turkcan*, Yiyin Zhou* (*: Alphabetical Order)
- **Generating Executable Mushroom Body and Lateral Horn Circuits from the Hemibrain Dataset with FlyBrainLab**
CNS*2020, 2020.
Building executable neural circuits for neuropils associated with learned and innate memories using recently-released single-synapse-scale connectomics data.
Aurel A. Lazar*, Mehmet K. Turkcan*, Yiyin Zhou* (*: Alphabetical Order)
- **Common SNP-based Haplotype Analysis of the 9p21.3 Gene Locus as Predictor of Coronary Artery Disease in Tanzanian Population**
Cellular and Molecular Biology (Noisy-le-Grand, France), 2019.
Studying the association of the 9p21.3 locus with Coronary Artery Disease in the Tanzanian population.
Gokce Akan, Peter Kisenge, Tulizo Shemu Sanga, Erasto Mbugi, Ismael Adolf, Mehmet K. Turkcan, Mohammed Janabi, Fatmahan Atalar
- **Face-looking Image Recognition**
2019 27th Signal Processing and Communications Applications Conference (SIU), 2019.
A generalizable approach for cross-modal face matching via deep transfer learning.
Mehmet K. Turkcan, Ege Çetin, Tayfun Akgül
- **Threatsim: Resolve Threats to Manufacturing Industries using Reinforcement Learning**
Columbia University Data Science Day, 2017.
Reinforcement learning to optimize planning of preventive maintenance and detect threats.
Kartikeya Upasani, Mehmet K. Turkcan, Albert Boulanger
- **Generation of $1/f^\alpha$ Noise via Frequency Scaling**
EMO Journal of Electrical, Electronics, Computers, Biomedical and Control Engineering, 4(8), 2014.
A scale transform in frequency domain can be utilized to generate noise with differing $1/f$ statistics.
Mehmet K. Turkcan, Tayfun Akgül

UNDERGRADUATE RESEARCH

◇ *Undergraduate Scholar*

March – December 2014

Istanbul Technical University Signal Processing Laboratory

Istanbul, Turkey

- Worked on a TUBITAK (The Scientific and Technological Research Council of Turkey) backed research project titled "Towards Automated Face Recognition: Sketch/Caricature-Photo Matching Using Caricature Making Techniques".
- Focused on the applications of machine learning and the design of potentially novel metric learning methods for face and sketch recognition problems.
- Designed, implemented and evaluated a new metric learning algorithm for cross-modal face recognition.

TECHNICAL SKILLS

- ◇ **Programming Languages:** C/C++, MATLAB, Python, Typescript, Javascript, HTML, CSS
- ◇ **Deep Learning Libraries:** TensorFlow, Jax, PyTorch, Theano, OpenAI Gym, Keras
- ◇ **Design Software:** LaTeX, Photoshop, Illustrator, InDesign