GÖRKEM AKGÜL

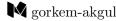✉ gorkem.akgul@st.uskudar.edu.tr   ⬡ Neurojedi   Ⓜ gorkem-akgul   ⬡ neurojedi.github.io

EDUCATION

USKUDAR UNIVERSITY
Bachelor of Science in Molecular Biology and Genetics (*2019 - 2023*)   GPA: 3.79

Graduated with **high honors** and **ranked 1st** in the department.
Thesis Title: Design Of Neuron-Specific Lentiviral Vectors And Investigation Of Gene Therapy Applications In Spinal Muscular Atrophy Disease - Supervisor: Cihan TASTAN - Thesis Poster: DOI

Bachelor of Engineering in Software Engineering - Double Major (*2020 - 2024*)   GPA: 3.88

Ongoing Graduation Project: Investigation of Graph-based Deep Learning Approaches for Brain Parcellation - Co-Supervisors: Nico SCHERF and Kristin BENLİ in collaboration with MPICBS

RESEARCH EXPERIENCE

Intern/Guest Researcher at Max Planck Institute for Human Cognitive and Brain Sciences, Germany   *July 2022 – October 2022 (via Erasmus+) / October 2022 – Present (Remote)*
Neural Data Science and Statistical Computing Group

- Conducted comparative analysis of dimensionality reduction techniques on fMRI data from the Human Connectome Project.
- Developed Neural Ensemble Segmentation Suite. In the final stages of development, NESS is a tool merging Convolutional Neural Networks and Vision Transformers for semantic segmentation tasks, particularly analyzing fluorescence images of neurons. Anticipated release: Early 2024, with a pre-print.
- Designed and implemented the lab's official website using Jekyll.
- Currently engaged in my second thesis work at the intersection of Brain Parcellation, Geometric Deep Learning, and Brain Alignment.

Supervisor: Nico SCHERF

Summer Research Intern at the Centre for Medical Image Computing at the University of College London   *July 2023 - November 2023*
Progression Of Neurodegenerative Disease (POND) Group

- Developed predictive models for Alzheimer's Disease (AD) using diverse biomarkers, including MRI, PET, DTI, genetics, and cognitive tests. Employed ensemble methods with tree-based algorithms to forecast critical AD biomarkers: ADAS-Cog13 score, ventricle volume, and clinical status
- Analyzed the significance of predictors to evaluate their impact on the application of predictive modeling in the onset of AD within clinical trials.

Supervisor: Neil OXTOBY and Maitrei KOHLI

Guest Researcher at Transgenic Cell Technologies and Epigenetics Application and Research Center   *January 2021 – June 2023*

- Played a significant role in the preparation of project proposals for funding from prestigious institutions such as TUBITAK and TUSEB. This effort resulted in the full funding of the project titled **"In Vitro and Ex Vitro Study of New Generation CRISPR-Prime Editing that targets Exon 7/Intron 7 of SMN2 Gene Regulation in Spinal Muscular Atrophy (SMA) and Approaches in SMN1 Encoding Motor Neuron Cell Specific Neural Lentivirus"** by TUSEB.
- Contributed to the development of neuron-specific lentiviral vectors for CRISPR-based therapies, focusing on neurological rare diseases, particularly Spinal Muscular Atrophy (SMA).
- Helped the development of innovative therapeutic approaches for treating Retinitis Pigmentosa, utilizing XNA-based antisense oligonucleotides and lentiviral vectors.

Supervisor: Cihan TASTAN

PATENTS

- CRISPR-PE System For Retinol Dehydrogenase 12 (Rdh12) Gene Mutations For Use In The Treatment Of Retinitis Pigmentosa (RP) Disease (pending, No: TR2021022284A2 / WO2023129095A1)
- Xeno Nucleic Acid Antisense-Oligonucleotide (XNA-ASO) Sequences for the Genetic Treatment of USH2A Induced Retinitis Pigmentosa Disease (pending, No: TR2022001648A2 / WO2023154026A1)
- Neural Lentiviral Vector Containing The Functional Abca4 Gene For Use In The Treatment Of Retinitis Pigmentosa (RP) Disease (pending, No: TR2022000448A2)
- Neurotrophic Factor And Optogenetic System-Based Lentiviral System For Use In Retinal Diseases (pending, No: TR2022021763A2)
- Methods for the Treatment of Spinal Muscular Atrophy (pending, No: TR2021018884A2)

INDUSTRY EXPERIENCE

Junior Intern Developer at OPTIIM *September 2016 – June 2017*

- As a high school student, worked part-time as a web developer, proficiently utilizing HTML, JavaScript, jQuery, and CSS to create websites for Project Portfolio Planning and Resource Management.
- Collaborated with test engineers to perform load testing and service virtualization, gaining valuable experience in quality assurance and software testing methodologies.

HONORS AND AWARDS

Department Ranking Award *June 2023*
I achieved 1st place in the Molecular Biology and Genetics class of 2023 at graduation.
Erasmus+ Student Mobility Grant by the European Commission *June 2022*
Ranked 5th in Erasmus score based on GPA and English Test among all Bachelor's and Master's applicants.

SKILLS

Programming/Computing Skills: C#, Java, Python, MATLAB, HTML, CSS, JavaScript, TensorFlow, scikit-learn, PyTorch, OpenCV, ImageJ/Fiji
Biological/Research Techniques: PCR, Western Blot, Immunohistochemistry, Sanger, BLAST, Viral Vector Design (Lentiviral), Apoptosis Quantitation with Annexin V, Primer Design (Benchling), CRISPR System Design

ADDITIONAL COURSES AND CERTIFICATIONS

- **"BrainX: Cellular Mechanisms of Brain Function"**, Duration: 8 weeks, ***EPFL***, Platform: Edx, Certificate.
- **"Multi-BrainX: The Multi-scale brain"**, Duration: 7 weeks, ***EPFL***, Platform: Edx, Certificate.
- **"Optimization: principles and algorithms - Linear optimization"**, Duration: 5 weeks, ***EPFL***, Platform: Edx, Certificate.
- **"Optimization: principles and algorithms – Network and discrete optimization"**, Duration: 5 weeks, ***EPFL***, Platform: Edx, Certificate.
- **"Optimization: principles and algorithms – Unconstrained nonlinear optimization"**, Duration: 6 weeks, ***EPFL***, Platform: Edx, Certificate.
- **"Fundamentals of Biomedical Imaging: Magnetic Resonance Imaging (MRI)"**, Duration: 6 weeks, ***EPFL***, Platform: Edx, Certificate.
- **"Image Processing and Analysis for Life Scientists"**, Duration: 7 weeks, ***EPFL***, Platform: Edx, Certificate.
- **"Probability - The Science of Uncertainty and Data"**, Duration: 16 weeks, ***MIT***, Platform: Edx, Certificate.
- **"Digital Signal Processing Specialization"**, Duration: 14 weeks, ***EPFL***, Platform: Coursera, Certificate.
- **"Computational Neuroscience"**, Duration: 8 weeks, ***University of Washington***, Platform: Coursera, Certificate.

- **"Practical Data Science with MATLAB Specialization"**, Duration: 18 weeks, ***Mathworks***, Platform: Coursera, [Certificate](#).
- **"Machine Learning"**, Duration: 11 weeks, ***Stanford University***, Platform: Coursera, [Certificate](#).
- **"IBM Machine Learning Specialization"**, Duration: 22 weeks, ***IBM***, Platform: Coursera, [Certificate](#).
- **"Deep Learning Specialization"**, Duration: 17 weeks, ***DeepLearning.AI***, Platform: Coursera, [Certificate](#).
- **"DeepLearning.AI TensorFlow Developer Specialization"**, Duration: 16 weeks, ***DeepLearning.AI***, Platform: Coursera, [Certificate](#).
- **"TensorFlow: Advanced Techniques Specialization"**, Duration: 16 weeks, ***DeepLearning.AI***, Platform: Coursera, [Certificate](#).
- **"Probabilistic Deep Learning with TensorFlow 2"**, Duration: 5 weeks, ***Imperial College London***, Platform: Coursera, [Certificate](#).
- **"Neuroscience and Neuroimaging Specialization"**, Duration: 16 weeks, ***Johns Hopkins University***, Platform: Coursera, [Certificate](#).
- **"Brain Science and Neuroscience: The Science of the Future"**, Summer School for High School Students, ***Kadir Has University***, [Certificate](#).
- **"Synapses, Neurons and Brains"**, Duration: 10 weeks, ***The Hebrew University of Jerusalem***, Platform: Coursera, [Certificate](#).
- **"Medical Neuroscience"**, Duration: 13 weeks, ***Duke University***, Platform: Coursera, [Certificate](#).
- **"Anatomy: Human Neuroanatomy"**, Duration: 7 weeks, ***Michigan University***, Platform: Coursera, [Certificate](#).
- **"Circadian clocks: how rhythms structure life"**, Duration: 6 weeks, ***LMU Munich***, Platform: Coursera, [Certificate](#).
- **"Sleep: Neurobiology, Medicine, and Society"**, Duration: 12 weeks, ***University of Michigan***, Platform: Coursera, [Certificate](#).
- **"Visual Perception and Brain"**, Duration: 5 weeks, ***Duke University***, Platform: Coursera, [Certificate](#).
- **"Music as Biology: What We Like to Hear and Why"**, Duration: 6 weeks, ***Duke University***, Platform: Coursera, [Certificate](#).