IREM B. GÜNDÜZ

PhD Candidate in Computer Science

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My research centres around the following questions: Which regulatory interactions are involved in changing cell states? What is the role of cell state changes in development systems and disease biology? How can we integrate sparse genomic data to infer disease dynamics? I develop interpretable computational frameworks to perform integrative single-cell multi-omics analysis and, to develop a better understanding of development systems and disease biology.

Education

Oct 2021- Present

Saarland University
Doctor of Philosophy
Computer Science
GPA: 1.0/1.0
Thesis Title: Inferring Cellular State and Regulatory Dynamics using Graph Neural Networks
Supervisor: Prof. Fabian MULLER

Aug 2017-Sep 2021

Marmara Univesity
Bachelor of Engineering
Bioengineering (English)
GPA: 3.21/4.00
Thesis Title: Discovery of New Drugs for the Inhibition of *N. Meningitidis* Computationally

Research Experience

June 2022- Present

Chair of Clinical Bioinformatics
Supervisor: Prof. Dr. Andreas KELLER
Saarland University

As a rotation student, I worked on quantification of alternative splicing events and, transcriptional network breakdown in aging content.

Jan 2022- Present

Integrative Cellular Biology and Bioinformatics Laboratory
Supervisor: Prof. Dr. Fabian MULLER
Saarland University

As a rotation student, I use single-cell bioinformatics to understand epigenomic changes in the content of pathogen explosure .

2021- June 2022

Bioinformatics and Omics Data Science Group
Supervisor: Dr. Altuna AKALIN
Berlin Institute of Medical System Biology

As a bioinformatics intern, I developed an R package called *deconvR*, to simulate and deconvolute omic profiles. Later, I worked on *"Multi-omics alleviates the limitations of panel-sequencing for cancer drug response prediction"* manuscript.

April- Aug 2021

Bishop Laboratory
Supervisor : Dr. Alexander J.R. BISHOP, Dr. Daniel MONTEMAYORD
Bioinformatics Research Network

As a project participant, I developed ensembl models to test benefits of using Rloop levels as a predictor for cancer tissue status in clinics.

2019- Aug 2021

Computational Biology and Bioinformatics Laboratory
Supervisor : Assoc. Prof. Dr. Pemra OZBEK SARICA
Marmara University

As a student assistant, I worked on computational investigations of biomolecular complexes. I worked on computational drug discovery methodologies.

June - Aug 2019

Neuroscience Laboratory
Supervisor : Assoc. Prof. Dr. Nurcan ORHAN
Aziz Sancar Institute of Experimental Medicine

As an intern, I participitated theoritcal and practical courses on neuroscience and learned how to perform wet-lab techniques such as western blotting, ELISA.

Work and Teaching Experience

Sep 2022 - Present

Integrative Cellular Biology and Bioinformatics Laboratory
Supervisor: Prof. Dr. Fabian MULLER
Saarland University

As the teaching assistant of the Single-Cell Bioinformatics course offered in Winter 2022 term at Saarland University, I tutored the assignments and, assisted students.

Aug 2021–Sep 2021

Bioinformatics and Omics Data Science Group
Supervisor: Dr. Altuna AKALIN
Berlin Institute of Medical System Biology

I worked as a teaching assistant in *the CompGen 2021: Hands-on Course on Machine Learning for Genomics*. I prepared the course material, including benchmark machine learning models and assisted the participants for capstone project.

Aug 2020–Oct 2020

VEM Pharmaceuticals

As an intern, I learned how to perform quality tests and, finalize the production of drugs.

Leadership and Volunteer Activities

April 2022–Present

Skill Assessment Team
Bionformatics Research Network (BRN)

As a code reviewer, I assest trainees coding skills in terms of code correctness and, cleanless.

June 2022–Present

Organazition Team
Journal Club in Ageing

As the leader of the club, I keep the club organize to track the up-to-date research in ageing.

June 2022–Present

Community Team
Bionformatics Research Network (BRN)

As the leader of BRN seminar series team, I led and organize series of workshops and presentations to help students to meet leading experts in the field and, track up-to-date research.

Oct 2018–Oct 2020

Journal And Promotion Team
Marmara University Bioengineering Society (BIYOM)

As the head of the team, I led and organize the content for Marmara University Faculty Of Engineering Students Club Magazine (MUFE'M).

Oct 2018–Jan 2019

Organazition Team
IEEE Marmara University Engineering in Medicine&Biology Society (EMBS)

As a team member, I contributed to organization of conferences.

Academic and Professional Honors

- Full Scholarship for Preparatory Phase of Doctoral Studies in Computer Science – *Saarland University*
- TUBITAK 1001 Research Scholarship – *Marmara University, Department of Bioengineering*
- Honor Student – *Marmara University, Department of Bioengineering*

Conferences, Presentations and Relative Engagements

- Single-Cell System Medicine Summer School – *Berlin Institute of Medical System Biology*
- Uncertainty in Artificial Intelligence (UAI)

Selected Publications and Open-Source Softwares

- ***deconvR*** *(Available in Bioconductor)* : Simulation and Deconvolution of Omic Profiles
- Baranovskii, A., **Gunduz, I. B.,** Franke, V., Uyar, B., & Akalin, A. (2022). Multi-omics alleviates the limitations of panel-sequencing for cancer drug response prediction. BioRxiv, 2022.06.15.496249. https://doi.org/10.1101/2022.06.15.496249

Courses and Certificates

- Data Science R Basics
- Introduction to Tidyverse
- Intermediate R Programming
- Machine Learning with Caret
- Python for Genomics
- Python Data Structures
- Introduction to Statistics with R
- Unsupervised Learning
- Linux Command Line: Shell Scripting