# 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 Regulatory Dynamics of Cell Fate Desicions using Deep Generative 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.

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| 2019- Aug 2021 | **Computational Biology and Bioinformatics Laboratory**<br>*Supervisor : Assoc. Prof. Dr. Pemra OZBEK SARICA*<br>**Marmara University**<br><br>As a student assistant, I worked on computational investigations of biomolecular complexes. I worked on computational drug discovery methodologies. |
| June - Aug 2019 | **Neuroscience Laboratory**<br>*Supervisor : Assoc. Prof. Dr. Nurcan ORHAN*<br>**Aziz Sancar Institute of Experimental Medicine**<br><br>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

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| Sep 2022 - Present | **Integrative Cellular Biology and Bioinformatics Laboratory**<br>*Supervisor: Prof. Dr. Fabian MULLER*<br>**Saarland University**<br><br>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**<br>*Supervisor: Dr. Altuna AKALIN*<br>**Berlin Institute of Medical System Biology**<br><br>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**<br><br>As an intern, I learned how to perform quality tests and, finalize the production of drugs. |

## Leadership and Volunteer Activities

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| April 2022–Present | **Skill Assessment Team**<br>Bionformatics Research Network (BRN)<br><br>As a code reviewer, I assest trainees coding skills in terms of code correctness and, cleanless. |
| June 2022–Present | **Organazition Team**<br>Journal Club in Ageing<br><br>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**<br>Bionformatics Research Network (BRN)<br><br>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**<br>Marmara University Bioengineering Society (BIYOM)<br><br>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**<br>IEEE Marmara University Engineering in Medicine&Biology Society (EMBS)<br><br>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