Çerağ **Oğuztüzün**

PhD Candidate · Computer Science · Cleveland, OH

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Research Interests

Precision Drug Repurposing, Graph Machine Learning, Knowledge Graphs, Language Models, Software Development for Bioinformatics Tools

Education

Case Western Reserve University — *Cleveland, OH*

Ph.D. in Computer Science (CGPA: 3.64) — *Sep. 2021 - May. 2025 (anticipated)*

- Supervisors: Prof. Rong Xu, Prof. Mehmet Koyuturk
- Specialization in Artificial Intelligence, Data Science and Bioinformatics

Bilkent University — *Ankara, Turkey*

B.S. in Computer Engineering (CGPA: 3.35) — *Sep. 2017 - Jun. 2021*

Minor in Molecular Biology & Genetics

Experience

Center for Artificial Intelligence in Drug Discovery, Case Western Reserve University — *Cleveland, OH*

Research Assistant — *Sep. 2023 - Current*

- I integrate patient-specific data into a knowledge graph of existing domain knowledge, to personalize drug repurposing strategies in the resolution of a single patient.

Foundation Medicine, Roche Group — *San Diego, CA*

R&D Machine Learning Engineer Intern — *June 2024 - Aug, 2024*

- I fine-tuned a BERT model as a deconvolution algorithm to identify cell type contributions based on methylation patterns in cfDNA, aimed at monitoring minimal residual disease and predicting cancer recurrence.

The Janssen Pharmaceutical Companies of Johnson & Johnson — *Philadelphia, PA*

R&D Machine Learning Scientist Intern — *May 2023 - Sep. 2023*

- I developed machine learning models and tools relevant to cell therapy and single-cell sequencing analysis.

Koyuturk Lab, Case Western Reserve University — *Cleveland, OH*

Research Assistant — *Sep. 2021 - Sep. 2023*

- I developed interpretable machine learning models to predict Intimate Partner Violence treatment outcomes, focusing on the intricate dynamics of its various forms. This involved navigating the challenges of small and highly variable datasets to identify key risk factors in recidivism.

The Experimental Drug Development Centre, A*STAR — *Singapore*

Computational Biology Intern — *Jun. 2022 - Sep. 2022*

- I designed and implemented both the frontend and backend of the Target Atlas Genetics Module, utilizing Python and R to achieve integration.
- I designed and executed a single-cell sequencing analysis pipeline for a Lupus disease study utilizing Nextflow.

Muyan Lab, Middle East Technical University — *Ankara, Turkey*

Research Assistant — *Jun. 2020 - Sep. 2021*

- I created a sophisticated motif search tool using Python to perform in-silico analysis of transcription factor binding motifs.

Seven Bridges — *Ankara, Turkey*

R&D Intern — *Aug. 2019 - Sep. 2019*

- I worked on implementing genomics data analysis and processing tools for the GRAF Suite.

Teaching

Department of Computer and Data Sciences, Case Western Reserve University — *Cleveland, OH*

Teaching Assistant — *Spring 2023 & Spring 2024*

- I assisted the **Bioinformatics for Systems Biology** (CSDS459) and **Machine Learning and Causal Inference** (CSDS600) courses.
- I provided valuable academic support to students with diverse backgrounds, offering office hours, developing assignments, and grading their work.

Skills

Programming Languages	Python, R, Java, C/C++, SQL, MATLAB, React, JavaScript, HTML, MIPS assembly
Technologies and Frameworks	Pytorch, Scikit-Learn, DGL, PyG, Git, GitHub, Linux, AWS, HPC, MySQL, PostgreSQL
Languages	Turkish (Native), English (TOEFL iBT:104) (C2), French (A2)

Publications

Journal & Conferences

- ***[Submitted]*** C. Oguztuzun, Z. Gao, H. Li and R. Xu, "Leveraging Disease-Specific Topologies and Counterfactual Relationships in Knowledge Graphs for Inductive Reasoning in Drug Repurposing," *2024*
- ***[Submitted]*** C. Oguztuzun, Z. Gao and R. Xu, "Precision Drug Repurposing: Single-Patient Level Modeling via Knowledge Graphs with Real-World Validation," *2024*
- ***[Submitted]*** C. Oguztuzun, M. Koyuturk and G. Karakurt, "Interpretable Machine Learning to Identify Risk Factors for Recidivism in Intimate Partner Violence," *2024*
- **[JMFT]** G. Karakurt, A. Baier, A. Bowling, S. Singuri, C. Oguztuzun, S. Bolen, "Systematic review and data synthesis on the treatment of sexual violence victimization by an intimate partner," *Journal of Marital and Family Therapy, vol. 50, no. 1, pp. 71–94, Sep. 2023.*
- **[AMIA 2023]** C. Oguztuzun, M. Koyuturk and G. Karakurt, "Characterizing Disparities in the Treatment of Intimate Partner Violence," *AMIA 2023 Informatics Summit, 2023.*
- **[Psychosocial Intervention]** C. Oguztuzun, M. Koyuturk and G. Karakurt, "Systematic Investigation of Meta-Analysis Data on Treatment Effectiveness for Physical, Psychological and Sexual Intimate Partner Violence Perpetration Psychosocial Intervention," *Psychosocial Intervention, 2023.*
- **[IEEE STC 2022]** Z. Varner, C. Oguztuzun, and F. Long, "Neural model for generating method names from combined contexts," *IEEE 29th Annual Software Technology Conference (STC), 2022.*
- **[Bioinformatics]** C. Oguztuzun, P. Yasar, K. Yavuz, M. Muyan, and T. Can, "Motifgenie: A python application for searching transcription factor binding sequences using chip-seq datasets," *Bioinformatics, vol. 37, no. 22, pp. 4238–4239, 2021.*
- **[Scientific Reports - Nature]** P. Yasar, G. Kars, K. Yavuz, G. Ayaz, C. Oguztuzun, E. Bilgen, Z. Suvacı, O. P. Cetinkol, T. Can, and M. Muyan, "A CPG island promoter drives the CXXC5 gene expression," *Scientific Reports, vol. 11, no. 1, 2021.*

Posters

- **[CSHL 2023]** T. Sztanka-Toth, C. Oguztuzun, N. Manyakov, T. Mansi, A. Javidi, "Multimodal Single-Cell Sequencing in Cell Therapy: Estimating Background Protein Signals to Enhance Data Normalization in CITE-Seq," *Genome Informatics 2023, Cold Spring Harbor Laboratory, 2023.*

Refereeing

- The Faculty Search Committee of the Department of Computer Science at Case Western Reserve University, 2024
- BioData Mining
- IEEE/ACM Transactions on Computational Biology and Bioinformatics
- Journal of Biomedical Informatics
- AMIA 2024
- ISMB/ECCB 2023
- RECOMB 2023

Honors & Awards

2024	**ACM-Women's Chapter Grace Hopper Sponsorship** based on merit	*Grace Hopper 2024*
2023	**AMIA LEAD Fund Trainee Scholarship** based on conference paper quality	*AMIA 2023 Informatics Summit*
2021	**Full tuition scholarship and financial support** based on merit	*Case Western Reserve University*
2018	**Merit scholarship** placed in the top 5% of individuals in the Computer Engineering program.	*Bilkent University*

Extracurricular Activities

Ballet	Royal Academy of Dance Grade 8, Teaching Certificate by the Ministry of National Education
Cello	University of West London Grade 2 Distinction
Ink Drawing	Self-taught
Bass Guitar and Music Production	Self-taught