Abdullah **Saydemir**

M.Sc. Computer Science, Technical University of Munich

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Education

Technical University of Munich (TUM) — *Munich, DE*

M.Sc. in Computer Science — *Oct 2022 - Present*

Özyeğin University — *İstanbul, TR*

B.Sc. in Computer Science — *Sep 2017 - Aug 2022*

- GPA: 4.00/4.00

Oregon State University — *Oregon, US*

Non-degree Exchange Student — *Mar 2021 - Jul 2021*

- GPA: 4.00/4.00

Publications (Peer Reviewed)

[1] **A. Saydemir***, M. Lienen*, and S. Günnemann. "Unfolding Time: Generative Modeling for Turbulent Flows in 4D", AI4Science Workshop, ICML, 2024.

[2] M. Elyasi, M. E. Simitcioglu, **A. Saydemir**, A. Ekici, O. Örsan Özener, and H. Sözer. "Genetic Algorithms and Heuristics Hybridized for Software Architecture Recovery", Automated Software Engineering Journal, 2023.

[3] M. Elyasi, M. E. Simitcioglu, **A. Saydemir**, A. Ekici, and H. Sözer. "HYGAR: A Hybrid Genetic Algorithm for Software Architecture Recovery", In Proceedings of the 37th ACM/SIGAPP Symposium on Applied Computing, 2022.

[4] **A. Saydemir**, M. E. Simitcioglu and H. Sözer, "On the Use of Evolutionary Coupling for Software Architecture Recovery", 15th Turkish National Software Engineering Symposium (UYMS), 2021.

Theses

[1] **A. Saydemir**. "Uncertainty Aware Structured State Space Models", Master's Thesis, Technical University of Munich, **In progress**.

[2] **A. Saydemir**, B. Arslan. "Essential Protein Prediction Using Graph Neural Networks", Unpublished Bachelor's Thesis, Özyeğin University, 2022.

Research Experience

Data Analytics and Machine Learning Group, TUM — *Munich, DE*

Research Assistant - *Generative Modeling, CFD Simulation* — *Apr 2023 - Present*

- Worked on generative diffusion models for turbulent flow simulation with Navier-Stokes equations in 4D.
- Integrated non-conventional laplacians to GNNs to enhance expressiveness of models.

Chair of Aerodynamics and Fluid Mechanics, TUM — *Munich, DE*

Research Assistant - *AI for Science* — *Sep 2023 - Aug 2024*

- Modeled collision operators in Lattice-Boltzmann equations with physics inspired geometric deep learning models.

Software Engineering Lab, Özyeğin University — *İstanbul, TR*

Research Assistant - *Software Architecture Recovery* — *Mar 2021 - Jun 2023*

- Developed algorithms and tools for recovering modular software architectures by mining code repositories.
- Built automated systems for investigating the effects of evolutionary coupling in software architecture recovery.

Sezerman Lab, Acıbadem University — *İstanbul, TR*

Intern - *Drug Repurposing* — *Jan 2022 - Mar 2022*

- Worked on drug repurposing for personal prescription for lung adenocarcinoma, breast cancer, and kidney cancer.
- Coded a drug scoring function using tissue specific GTEx, essentiality, and topological data.

Teaching Experience

2020-2021 **Teaching Assistant**, Discrete Mathematics, Özyeğin University — *İstanbul, TR*

2020 **Teaching Assistant**, Differential Equations, Özyeğin University — *İstanbul, TR*

2019-2020 **Teaching Assistant**, Calculus II, Özyeğin University — *İstanbul, TR*

2019-2020 **Teaching Assistant**, Calculus I, Özyeğin University — *İstanbul, TR*

Honors & Awards

Present	**Scholar,** TUM: Junge Akademie	*Munich, DE*
2022	**High Honors,** Özyeğin University	*İstanbul, TR*
2021	**Honor Roll,** Oregon State University	*Oregon, US*
2021	**Best Paper Award,** 15th Turkish National Software Engineering Symposium	*İzmir, TR*
2021	**Certificate of Appreciation,** Özyeğin University	*İstanbul, TR*
2021	**Champion as a Team,** Turkish Intercollege Chess League	*Online*
2018-2022	**ISOV Scholar,** İstanbul Chamber of Industry	*İstanbul, TR*
2017-2022	**Full Merit Scholarship,** Özyeğin University	*İstanbul, TR*

Volunteer Work

Speech and Language Processing Book

Contributor

- Corrected calculations and typographical errors in 3rd edition of Stanford NLP book by Prof. Jurafsky and Prof. Martin.

HackMIT '23

Mentor

- Answered variety of coding questions from hackathon participants.

German - Turkish Friendship Association

Volunteer in Post Disaster Aid Team

- Collected, classified, and packaged medical aid, hygiene products, childcare kits, food, baby food, batteries, generators, and other first response items to be sent to Pazarcık, a town in the epicenter of the two major earthquakes that hit southern Türkiye in 2022.

Leadership & Club Activities

IEEE Computer Science Society, IEEE Student Branch

İstanbul, TR

Chairman — *Sep 2020 - Feb 2021*

- Hosted a four-hour crash course on git, GitHub, and personal website setup for non-engineering students.
- Organized Global Game Jam '21, a three full-day event for those interested in game design and development.

IEEE Student Branch

İstanbul, TR

Board Member — *Sep 2020 - Feb 2021*

- Organized tea talks with professors working in the industry and reached more than a thousand participants.
- Live streamed events organized by the societies under the student branch and published the edited recordings on YouTube.

Skills

Natural Languages	Turkish (Native), English (C1-C2), German (A1)
Programming Languages	Python, C++, Java/Kotlin, Rust
Libraries & Frameworks	PyTorch, Jax, Numpy, Scipy, MPI, OpenMP, CUDA, Nvidia Modulus
Tools	Git, GitHub, Github Actions, Azure DevOps, Jira
Topics	Machine Learning, Deep Learning, HPC
Certificates	AI for Science, Multi-GPU Programming

Work Experience

Datart

Remote, TR

Software Engineer - Operations Optimization — *Feb 2022 - Mar 2023*

- Developed the fuel estimation algorithm for haul trucks for Komatsu & Modular Mining.
- Coded an optimizer that produces possible future missions and refuel windows of a truck.

QuantWiFi

İstanbul, TR

Embedded Software Engineer - Network/Data Analysis — *Mar 2021 - Jan 2022*

- Contributed to WiFi analyzer that scans the network and extracts relevant information.
- Implemented a testbed with prplMesh, MiniNet and other hardware simulators.