Ege Demirci

LinkedIn: @egedemirci
Github: @egedemirci

egedemirci.net
Email: egedemirci@ucsb.edu,

EDUCATION

- **University of California, Santa Barbara** — Santa Barbara, USA
  Doctor of Philosophy - Computer Science — September 2024 - June 2028 (Expected)
  Advisor: *Ambuj K. Singh, Academic Excellence Fellowship*

- **Sabanci University** — Istanbul, Turkey
  Bachelor of Science - Computer Science and Engineering; GPA: 4.0 / 4.0 — September 2019 - June 2024
  Graduated as 1st ranked student in the Faculty of Engineering (1/609), %100 Scholarship

PUBLICATIONS

- [1] **Demirci, E.**, Kerur, R., & Singh, A. (2025). *Are LLMs Truly Graph-Savvy? A Comprehensive Evaluation of Graph Generation.* **(ACL 2025 - SRW)**

- [2] **Demirci, E.**, Bullo, F., Swami, A., & Singh, A. (2025). *GroupGAT: Physics–Aware, Symmetry–Preserving Graph Attention for Network Flow Completion.* **(Under review for NeurIPS 2025.)**

- [3] **Demirci, E.**, Singh, A. (2025). *Graph Neural Networks Should Learn Symmetry: A Third-Wave Agenda for Automatic and Adaptive Equivariance.* **(Under review for NeurIPS 2025 Position Track.)**

- [4] **Demirci, E.**, Tuzun, E., Un, A. F., Sonmez, T. G., & Varol, O. (2025). *From Occasional to Steady: Habit Formation Insights From a Comprehensive Fitness Study.* **(Presented at IC2S2 2025, under review for journal.)**

- [5] Najafi, A., Mugurtay, N., Zouzou, Y., **Demirci, E.**, Demirkiran, S., Karadeniz, H.A., & Varol, O. (2024). *First public dataset to study 2023 Turkish general election.* *Scientific Reports, 14(1), 8794.*

RESEARCH EXPERIENCE

- **DYNAMO Lab, UC Santa Barbara** — Santa Barbara, USA
  Researcher, Advisor: Dr. Ambuj Singh — September 2024 - Present
  - Developed **GroupGAT**, a graph attention architecture that integrates symmetry-preserving group actions with bilevel optimization for network flow completion, achieving up to **10% RMSE reduction** over prior state-of-the-art. **[2]**
  - Led a comprehensive evaluation of **15 state-of-the-art LLMs** on 5 graph generation tasks, establishing a reproducible framework for structural reasoning assessment. **[1]**
  - **Research Focus:** Graph Machine Learning, Physics-Informed Machine Learning, Representation Learning

- **Mars Athletic** — Istanbul, Turkey
  Research Scientist (Part-Time) — September 2023 – August 2024
  - Led a large-scale study on exercise habit formation using machine learning and causal inference, analyzing data from 200,000+ members of Mars Athletic (Turkey's largest gym chain). **[4]**
  - Coordinated project design and team efforts, introducing a novel survival metric to quantify habit durability.
  - Evaluated the impact of interventions (group classes, personal training, social interactions) on long-term exercise adherence, providing actionable insights for management and public health.
  - **Research Focus:** Machine Learning for Behavioral Sciences, Causal Inference, Health Analytics

- **Viral Lab - VRL Lab, Sabanci University** — Istanbul, Turkey
  Researcher, Advisor: Dr. Onur Varol — January 2022 - August 2024
  - Analyzed misinformation and propaganda networks on X and YouTube during the 2023 Turkish elections. **[5]**
  - Built a scraper to collect X profiles of 1,500+ politicians active since 2010, creating the first public dataset of Turkish politicians with trending topics, media contacts, and follower dynamics.
  - Collected 1M+ YouTube comments, performed sentiment analysis, and studied causal links between media coverage and political polarization.
  - **Research Focus:** Applied Machine Learning, Computational Social Science, Network Science, Social Networks

- **Computational Intelligence Group, Vrije University** — Amsterdam, Netherlands
  Research Intern, Advisor: Dr. Anil Yaman — June 2022 – September 2022
  - Developed reinforcement learning agents for MuJoCo and Classic Control environments in GymLibrary.
  - Implemented neural network solutions for CartPole, Ant, Hopper, and Acrobot, and evaluated performance using standard RL benchmarks and metrics.
  - **Research Focus:** Reinforcement Learning, Artificial Neural Networks

PROFESSIONAL EXPERIENCE

- **AppFolio** — Santa Barbara, USA
  Software Engineer Intern — June 2025 - September 2025
  - Developed and maintained features for AppFolio Investment Manager product using **Ruby** and **React**, improving user workflows for property investment clients.
  - Resolved user-reported UX issues, increasing the team's average monthly UX bug fixes by **300%** through streamlined debugging processes.
  - Partnered with designers and QA to redesign critical investment dashboards, optimize data-loading performance, and ensure smooth backend–frontend integration for complex investor workflows.

- **Commencis** — Istanbul, Turkey
  Software Engineer (Part-Time) — *July 2023 – August 2024*
  - One of four engineers maintaining and enhancing the iOS platform for **Turkcell**, Turkey's largest mobile operator with 35M+ users; led the redesign of the app's campaign flow in **Swift**, improving user engagement and conversion tracking.
  - Worked closely with product, design, and QA teams in an Agile environment, contributing to sprint planning, daily stand-ups, and peer code reviews to ensure timely, high-quality releases.
  - Optimized core app components, resolving critical bugs and improving performance stability, resulting in faster load times and reduced crash rates.

TEACHING EXPERIENCE

- **Sabanci University** — Istanbul, Turkey
  Learning Assistant — *September 2021 - June 2024*
  - **IF100 - Computational Approaches to Problem Solving** course from September 2021 to June 2022, teaching Python and computational logic to all freshman students.
  - **CS210 - Introduction to Data Science** course from September 2022 to January 2024, teaching Machine Learning and Data Science techniques to 2nd and 3rd year Computer Science and Engineering students.
  - **CS414/514 - Network Science** course from January 2024 to June 2024, teaching network analysis and complex systems concepts to senior undergraduate and master Computer Science and Engineering students.
  - Assisted students during weekly recitation hours to reinforce lecture topics, prepared materials for the recitation, prepared assignments, and provided further assistance during office hours.

SKILLS SUMMARY

- **Programming Languages:** Python, SQL, C++, JavaScript, Ruby, Dart, Swift
- **Tools and Frameworks:** PyTorch, Scikit-learn, Pandas, DGL, NetworkX, Selenium, DoWhy, Git, PostgreSQL, Gephi, Flutter, React, Ruby on Rails, Express.js, Node.js
- **Soft Skills:** Research Leadership, Cross-Functional Collaboration, Analytical Thinking, Communication, Problem-Solving, Project Management, Adaptability, Mentorship

VOLUNTARY WORK

- **Cayirova Sevgi Evi** — Kocaeli, Turkey
  Teacher — *February 2020 - June 2020*
  - Visited an orphanage in Cayirova on a weekly basis during preparatory year at university.
  - Provided assistance to children aged 7-12 in the orphanage, helping with their school life and spending time together.
  - Worked collaboratively with other volunteers to ensure the success of the project and provide the best possible experience for the children.

- **75. Yil Ilkokulu** — Hatay, Turkey
  Employee — *June 2021 - July 2021*
  - Volunteered at a primary school close to the Syria refugee camps in Hatay in June 2021.
  - Spent time with the children. Taught some basic coding concepts to the children, introducing them to the world of technology and programming.