Gökdeniz Çakır

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EDUCATION

Sabancı University — B.S. Computer Science & Engineering (2024-2028)
- Minor in Mathematics

Middle East Technical University (METU) — Business Administration (2022-2023)

TECHNICAL SKILLS

Programming: Python, C++
ML & Data: PyTorch, NumPy, pandas
Formal Methods: Lean 4
Languages: Turkish (Native), English (Fluent)

PROJECTS

tercih24 - (www.tercih24.com)

- A recommendation engine helping students optimize university application lists via mathematics.
- Indexes **100+ universities and 21,000+ programs** over 4 years.
- Validated algorithm by testing robustness to year-over-year shifts via **10,000+ simulated profiles**.
- Uses probabilistic shaping to allocate targets across tiers, scoring by rank proximity, distance and university rankings.
- Built **Android** integration and deployed on **Google Play Store**.
- Tech: Python, FastAPI, pandas, NumPy, Cloud Run

snake47 - (github.com/snake47)

- **AI** that learns to play Snake without explicit helping algorithms such as flood fill or Hamiltonian cycle finding.
- Compared **DQN (CNN)** vs simple **MLP** vs **Evolutionary Strategy** approaches for Snake.
- **Diagnosed** training plateaus, **iterated** on reward shaping and architecture.
- ES agent achieves avg score **~60**, peak **79 (81% board coverage)** on 10x10 grid.
- Tech: PyTorch, DQN (CNN / MLP)

geoparse - (github.com/geoparse)

- An **end-to-end** geometric diagram **generator, parser and solver**.
- Built a pipeline generating **38,000+ synthetic diagrams** to train ResNet18 parsers, achieving **<0.001 val loss**.
- Implemented an **analytic solver** for exact geometric reasoning.
- Identified vision parsing as **sim2real** transfer bottleneck.
- Tech: PyTorch, ResNet, OpenCV, NumPy

ClassicalBench - researchgate.net/preprint - github.com/classicalbench

- Built a **benchmark** for score-based popularity prediction in classical music.
- Wrote a **preprint paper** showcasing **methodology and findings**.
- Found **~8% ceiling** on computational analysis of classical music notes.
- Found **composer identity** explains **34%** of the **variance** for popularity.

RESEARCH EXPERIENCE

Undergraduate Researcher — Sabancı University (Fall 2025)

Working on LLM reasoning capabilities through formal verification in Lean.

- Tested 5 frontier models' ability to restore broken proofs in Lean. github.com/lean-proof-repair
- Automated proof restoration process involving agents interacting with each other via Autogen.
- Tested frontier models' ability to write logic puzzle model checkers to tackle logic problems via Lean.
- Built evo_prover, an evolutionary proof searching agent that uses compiler feedback as fitness signal; GA solves 69% of benchmark theorems vs 38% for hill climbing. github.com/evo_prover