# 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 Turkish students optimize their university application process via mathematics.
- Uses Kumaraswamy distribution to allocate targets across tiers, scoring by rank proximity, distance and university rankings.
- Indexes **200+ universities and 21,000+ programs** over 4 years.
- Validated algorithm by testing robustness to year-over-year shifts via **10,000+ simulated profiles**.
- Used by **hundreds** of real students since its creation.

### 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.

### ClaudeOS — github.com/ClaudeOS · blogpost

- An **AI coded operating system** that can port and run DOOM, built in 2 days from scratch.
- Built a 32 bit x86 architecture OS, mainly written in C, assembly for essentials.
- Set up **agentic workflow** with multiple **subagents** that optimizes for collaboration and minimal bugs.
- Has keyboard and mouse integration, GUI and simple apps such as calculator and timer.

## Research

**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 an evolutionary proof searching agent that uses the feedback of Lean's kernel as fitness signal and outperforms hill climbing on the benchmark theorems. github.com/evo_prover