

Ali Tavakoli

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EDUCATION

Sharif University of Technology

Tehran, Iran

M.Sc. in Computer Science

Expected Fall 2026

- Admitted through the **Exceptional Talents** provision (national quota of only 2 students), which allows top-ranked undergraduates to enter the M.Sc. without taking the entry exam.

University of Tehran

Tehran, Iran

B.Sc. in Computer Science, Minor in Mathematics (Expected Graduation: 2026) Sep 2022 – Present

- **GPA:** 19.26/20 | **Rank:** 2nd out of 42 students.
- **Computer Science (selected):** Design & Analysis of Algorithms (20/20), Data Structures & Algorithms (19.5/20), Graph Theory (19.1/20), Fundamentals of Combinatorics (20/20), Computability Theory (20/20), Mathematical Logic (19.8/20), Advanced Programming (19/20), Fundamentals of Computer Science and Programming (20/20), Fundamentals of Theory of computation (19.75/20).
- **Mathematics (selected):** Linear Algebra (20/20), Mathematical Analysis I–II (20/20), Convex Analysis (Graduate-level, 20/20), Linear Programming (20/20), Stochastic Processes (20/20), Game Theory (17.25/20).

HONORS AND AWARDS

- **Top 0.5%** in the National University Entrance Exam (Konkur) among 100,000+ candidates (Math & Engineering).
- **Iranian National Olympiad in Informatics (INOI):** National finalist and recipient of the Diploma of Honor (Top 80 in Iran).

RESEARCH EXPERIENCE

Undergraduate Research in Mathematical Optimization

Ongoing

Advisor: Dr. Soleimani Damaneh, University of Tehran

- Surveying and comparing different techniques for solving **integer programming** problems.
- Studying **duality** in integer programming, including Lagrangian and superadditive duality.

INDEPENDENT STUDY

Reading Research Papers in Algorithms, Graph Theory, and Game Theory

- Studied a paper by Li, Peng, Wang, and Zhou on fairness-aware facility location models with externalities.
- Read Kim et al.'s paper on LOCAL certification of MSO2 properties in treewidth-bounded graphs – the part connecting logic to distributed algorithms was the most interesting to me.
- Went through a paper by Bateni, Esfandiari, HosseinGhorban, and Montaseri on density-based active covering methods.

RESEARCH INTERESTS

Theoretical computer science, especially graph theory, algorithms, and combinatorics. Related interests include combinatorial optimization and integer programming.

ACADEMIC SERVICE

- **Grader, Iranian National Olympiad in Informatics (INOI)**

Summer 2024

TEACHING EXPERIENCE

University of Tehran

- **Head Teaching Assistant**
 - **Graph Theory** (2 semesters) – Dr. M. Mohammad-Noori
 - **Fundamentals of Combinatorics** – Dr. M. Mohammad-Noori
 - Prepared assignments and quizzes, coordinated grading, and led weekly problem sessions for 40+ students.
- **Teaching Assistant**
 - **Algorithms:** Design & Analysis of Algorithms, Data Structures & Algorithms
 - **Mathematics:** Linear Algebra, Mathematical Analysis, Calculus II
 - **Programming:** Advanced Programming (C++), Basic Programming (C)

Sharif University of Technology (MicroMaster Platform)

- **Teaching Assistant**
 - **Discrete Mathematics** – Dr. Abam
 - Recorded comprehensive video tutorials detailing step-by-step solutions for assigned course exercises on the university's open education platform.

WORKSHOPS & ADVANCED TRAINING

Nesin Mathematics Village

August 2026

- **Probability in Turkey 2026:** Selected for this competitive summer school; fully funded, including travel and accommodation.

Institute for Research in Fundamental Sciences (IPM)

Summer 2023

- **Summer Mathematics School:** Lectures on analytic number theory and random graphs.

SELECTED PROJECTS

- **SAT-Based Solver for Sokoban** ([GitHub](#)) June 2024
 - Modeled the puzzle using propositional logic and reduced it to SAT.
 - Converted constraints to CNF and decoded solution paths using a SAT solver.
- **Multi-Armed Bandit Simulation (Bakery Problem)** ([GitHub](#)) July 2023
 - Implemented **Thompson Sampling** using Beta–Binomial models.
 - Simulated stochastic rewards and evaluated performance in Python (NumPy, SciPy).
- **Bayesian Inference via MCMC (Metropolis–Hastings)** Sep 2025
 - Implemented the Metropolis–Hastings algorithm for sampling from complex distributions.
 - Used MCMC for parameter estimation in a linear model.
- **Competitive Programming:** Active participant on Codeforces and AtCoder. Maximum Codeforces rating 2007 (Candidate Master), Maximum AtCoder rating 1437 (3 Kyu). Experience with graph algorithms, dynamic programming, and number theory. Account : ([Codeforces](#)) - ([Atcoder](#))

TECHNICAL SKILLS

- **Programming Languages:** Python, C++, C
- **Tools:** L^AT_EX, Git, Linux
- **Languages:** Persian (Native), English (TOEFL iBT 102: R29, L28, W24, S21)