

KHALED SHERIF

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[Portfolio Website](#) | [GitHub](#) | [Zenodo Archive](#)

EDUCATION

El-Sadat STEM School

Menoufia, Egypt

High School Diploma (Advanced Mathematics & Physics)

GPA: 3.7 / 4.0 (Unweighted)

Related Coursework: Applied Machine Learning, Pure Math (Calculus), Applied Math (Mechanics & Statistics), Modern Physics, CS & Programming Honors, Capstone Research Project.

National Distinction: Ranked 364th out of 16,000+ applicants (Top 2.2%) in the National STEM Admissions Test.

HONORS & AWARDS

- **1st Place Worldwide – Purple Comet Math Meet:** Ranked 1st out of 4,613 teams. Apr 2025
- **National Team Member – IMO & PAMO:** Selected for the Egyptian National Math Team. Apr 2025
- **Rank 8 Nationally – Egyptian Physics Olympiad (EPHO):** Gold Medalist; Top 1%. Feb 2025
- **2nd Place National – ESEF (ISEF Qualifier):** Math Research Feb 2025
- **Best Category Award – BlastOff Science Fair:** Info Theory & Linguistics 2024

INDUSTRIAL & RESEARCH EXPERIENCE

Lead Investigator | Variational Trajectory Optimization (ESEF Research)

[\[Paper\]](#)

Supervised by Dr. Mohamed Magdy @ Faculty of Engineering, Menoufia University

2024 – 2025

- **Architected** a mathematical framework utilizing the **Euler-Lagrange equation** to minimize travel time functionals in high-speed rail networks.
- Achieved a **55.65% reduction** in theoretical transit latency; validated via Stanley Controller in MATLAB to ensure real-world stability.

Optimization Research Intern | City Plast (Industrial Manufacturing)

[\[GITHUB\]](#)

Project: Industrial Waste Minimization Model

2025 – Present

- **Engineered** a predictive model to optimize polymer extrusion lines, **reducing industrial scrap by 12%**.
- **Synthesized** industrial datasets to improve material durability via iterative mathematical modeling.

Research & Mentorship Lead | Endeavor Research Program

2024 – 2025

Mentoring high-performance students on research design and problem formulation.

- Provided methodological guidance resulting in student placement at **Harvard University**.

Mechanical Engineering Assistant | Construction Site (Internship)

Summer 2024

- **Assisted** in machinery repair diagnostics, precision measurement, and CAD drafting.

TECHNICAL PROJECTS

CarbonCraft: Open-Source 3D Molecular Modeling

[\[Paper\]](#)

Software Architect | Python, Ursina Engine, RDKit

2024 – 2026

- Developed a 3D visualization platform for hydrocarbon derivatives achieving real-time **140 FPS** rendering.
- Integrated **RDKit** to automate SMILES generation and **VSEPR geometric theory** enforcement.

TRACE: Turtlebot for Adverse Congestion

[\[Poster\]](#) | [\[GITHUB\]](#)

Intelligent Road System for Emergency Green Corridors | ROS, Python, LiDAR

2025

- Designed an autonomous traffic system achieving a **53.11% Efficiency Index** via LiDAR-based detection.

- Developed real-time notification backend using **Flask API** for 0.425s response latency.

Neuro Synch: BCI EEG Signal Processing

[\[Poster\]](#) | [\[GITHUB\]](#)

Physiological & Mental Health Monitoring Framework | Python, MNE

2024

- Architected a framework to monitor mental health via EEG brainwave analysis and cortisol tracking.

AquaPure: Automated Purifier

[\[Poster\]](#) | [\[GITHUB\]](#)

Wastewater Recycling for Agricultural Sustainability | Arduino, IoT

2024

- Engineered a 7-cycle purification system; reduced TDS from **1845 ppm to 424 ppm**.

LEADERSHIP & IMPACT

Founder & Lead Coach | Pi4U (Math Olympiad Incubator)

2025 – Present

Training 230+ students for IMO/PAMO competition

- Developed original logic curriculum; improved average student scores by **+11 points**.

Academic Mentor | SadatSTEMpire (Nonprofit Education)

2023 – 2024

- **Directed** math courses for **1,500+ students**; curriculum boosted acceptance by 17%.

Student Council President | Qwesna Official Language School

Grade 9 – 10

- **Led 1,500+ students**; managed 12,000 EGP for charity and launched Mental Health initiatives.

Vice President | El-Sadat STEM Robotics Club

2024 – Present

- Directed 14+ teams; mentored junior peers in PID control fusion and CAD design.

COMMUNITY SERVICE & VOLUNTEERING

- **Resala Charity Organization:** Distributed meals to 200+ individuals; led 5+ large-scale clean-up initiatives.
- **Independent Volunteer Chess Tutor:** Tutored 70+ peers; improved average student ELO by 150.

TECHNICAL SKILLS & ARTS

- **Technical:** Variational Calculus, Graph Theory, Python (NumPy, SciPy, Flask), MATLAB/Simulink, CAD, LaTeX.
- **Languages:** Arabic (Native), English (Fluent), French (Academic/Intermediate).
- **Personal:** Varsity Volleyball (Setter of the Year); Self-taught Pianist and Composer (480+ hours recorded).