

Mohamed Elsayed

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EDUCATION

University of Toronto

Bachelor of Engineering in Engineering Science

Toronto, Ontario

Sep 2025 – May 2030

Relevant Coursework: Data Structures & Algorithms (Python/C), Linear Algebra, Engineering Mathematics & Computation, Calculus I/II

EXPERIENCE

Technical Lead & Head of Technology

Aug 2023 – Present

Al Mannar NGO

Luxor, Egypt

- Designed and maintain the charity's **core production database** managing beneficiary records, financial disbursements, and sensitive personal data.
- Develop and support **backend systems and internal tools** in Python using a relational database, ensuring data integrity and reliability.
- Own **software architecture** and ongoing technical decision-making supporting day-to-day operations.

Undergraduate Research Assistant

July 2025 – Aug 2025

American University in Cairo (AUC)

New Cairo, Egypt

- Built a **microcontroller-based control system** to automate a precision translation stage for optics experiments.
- Designed and tested motor control and magnetic field circuits; integrated **embedded software in C++**.

Backend Intern

July 2024 – Aug 2024

eVision

New Cairo, Egypt

- Engineered a **scalable file-parsing system** to automate data ingestion and processing.
- Collaborated with frontend, database, and QA teams in a **cross-functional agile** environment.

Software Developer & Technical Animator

Oct 2021 – July 2023

Self-Employed

Remote

- Contributed to collaborative game projects reaching **1.5B+ visits** and **250K+ concurrent players**.
- Implemented gameplay systems, technical animation, and real-time VFX using **Lua, Python, Moon Animator, and Blender**.
- Completed independent commissions delivering custom visual effects and animation systems to client specifications.

PROJECTS

Gaussian Entanglement in Noisy Bosonic Channels | *Python*

Dec 2025 – Present

- Derived a **closed-form entanglement survival threshold** for two-mode squeezed vacuum states under symmetric Gaussian channels using the symplectic-invariant formulation.
- Implemented numerical benchmarks comparing exact log-negativity with a determinant-based analytic upper bound; identified regime-dependent tightness.
- Produced a reproducible research note with analytic derivations, parameter sweeps, publicly available figures & data.

LaTeX Notetaker Converter | *TypeScript, Python, CSS*

Dec 2025 – Present

- Built a web tool to convert handwritten, typed, and audio notes into **structured LaTeX documents** optimized for notation-heavy coursework and technical writing.
- Implemented **OCR, parsing, and automation pipelines** to generate compilable LaTeX with equations, figures, and modular document organization.

Structural Beam Simulation | *Python, MATLAB*

Nov 2025

- Built a general-purpose beam simulation engine for arbitrary cross-sections by computing section properties from geometry; generating deflection curves and factor-of-safety statistics via **numerical integration**.
- Developed **MATLAB 3D stress/deformation visualizations** including deflection animations under moving/distributed loads; validated predictions against physical tests.

TECHNICAL SKILLS

Programming Languages: Python, C, Java, JavaScript, TypeScript, SQL, MATLAB, HTML/CSS, Lua

Hardware & Electronics: Microcontrollers, Motor Control, Circuit Design, PCB Assembly, Sensors

Developer Tools: Git, VS Code

Libraries: NumPy, Matplotlib