Ahmad Abbass Chreif

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Dual-degree student in Computer Science and Applied Mathematics passionate about optimization, learning systems, and quantitative modeling. I'm interested in how mathematical structures and data-driven methods can inform decision-making—whether in scientific computing, AI, or finance—and I aim to bridge theoretical insight with practical implementation.

Education

American University of Beirut (AUB) — Beirut, Lebanon   Expected Dec 2026
BS in Computer Science & Applied Mathematics (Dual Degree)   *GPA: 4.0/4.0*

- Dean's Honor List (all semesters); Merit Scholarship (top 2% of entering class).
- Key Coursework: Machine Learning, Numerical Linear Algebra, Optimization, Algorithms, Theory of Computation.

German International School Beirut   2023
International Baccalaureate Diploma   *Score: 42/45 (98th percentile)*

Research Experience

Undergraduate Researcher — Causality-Enforced PINNs for Stiff PDEs   Sept 2025 – Present
Supervisors: Dr. Nabil Nassif & Dr. Sophie Moufawad, Dept. of Mathematics, AUB   *Beirut, Lebanon*

- Investigating causality-enforced neural networks for stiff PDEs arising in polar firn gas-diffusion models.
- Implementing time-causal weighting and adaptive residual scaling to stabilize early-time gradients and improve convergence.
- Analyzing gradient stiffness, multi-scale optimization dynamics, and residual propagation in PINN architectures.

Selected Projects

Fourier Neural Operator Extensions for PDE Learning   *Python, PyTorch*

- Extending the `neuraloperator` open-source framework with custom spectral layers and PDE-aware training modules.
- Added a loss-enforced Navier–Stokes residual for 2D incompressible fluids to improve physical consistency during training.
- Experimenting with multi-resolution supervision and stability-enhancing regularization for operator learning.

Capacity & Override Request Automation System   *Microsoft Power Platform*

- Built an internal system automating course capacity and prerequisite override workflows for the CS Department.
- Reduced manual processing time via Power Automate flows, model-driven apps, and role-based access control.

AUBConnect — Course & Professor Review Platform   *React, Node.js, MySQL*

- Developed a full-stack platform enabling authenticated student reviews with a responsive React frontend and RESTful backend.
- Implemented secure authentication, optimized database queries, and deployed the platform with modular architecture.

Teaching & Leadership

Teaching Assistant — Programming for Everyone   Sept 2025 – Present
Department of Computer Science, AUB   *Beirut, Lebanon*

- Guide weekly lab sessions on Python fundamentals and algorithmic problem-solving for first-year students.
- Assist in designing and grading programming assignments with emphasis on debugging and structured logic.

Mathematics Tutor — AUB Math Tutoring Center   Aug 2025 – Present
Department of Mathematics, AUB   *Beirut, Lebanon*

- Tutor 50+ students in calculus, linear algebra, and proof-based reasoning, emphasizing conceptual understanding.
- Organize review sessions and mentoring workshops for advanced mathematics courses.

Technical Support Intern   June 2024 – Aug 2024
IT Office, American University of Beirut   *Beirut, Lebanon*

- Provided hardware and software support for faculty and labs, improving troubleshooting documentation and workflow efficiency.

Technical Skills

Programming: Python, C, C++, Java, MATLAB, JavaScript
Frameworks & Tools: PyTorch, React, Node.js, Express, MySQL, Git, Power Platform, LaTeX
Domains: Machine Learning, Optimization, Numerical Methods, PDE Modeling, Full-Stack Development
Languages: Arabic (native), English (fluent), German (proficient)