

Islam Alzhougi

islamalzhougi@gmail.com | <https://www.linkedin.com/in/islam-alzhougi> | (203) 589-7019 | islamalzhougi.com

EDUCATION

CT State Community College, New Haven, CT

Expected May 2027

Relevant Coursework: *Fluid Mechanics, Statics, Computer Software Applications, Parametric Design, Differential Equations, Quantum Mechanics*

GPA: 3.8/4.0

Yale University, New Haven, CT

Pre-doctorate Fellow: *Applied Physics (Part-time)*

Relevant Coursework: *Fluid Mechanics, Statics, Computer Software Applications, Parametric Design, Differential Equations, Quantum Mechanics*

Honors & Awards: *Dean's List, High School Valedictorian, 2X FIRST Robotics National Finalist, FIRST International Design Award, Lybotics Design Award, Libyan Minister of Education Commendation, Phi Theta Kappa Honor Society, Libyan Ministry of Education: STEM Educational Grant*

International School of Martyrs, Tripoli, Libya

June 2024

A-Levels: Pure Math (A), Physics (A*), Mechanics (A*), English 1st Lang (A*).

RELEVANT EXPERIENCE

Rakich Lab (Yale SEAS) | *Undergraduate Researcher (Cavity OptoMechanics)*, New Haven, Connecticut

June 2026 – September 2026

- **Automated PDH Lock System:** Developed and deployed an automated Pound-Drever-Hall (PDH) locking system adopted across six research laboratories to streamline lock acquisition and maintain long-term cavity stability.
- **Laser Frequency Stabilization & Instrumentation:** Designed and implemented PDH locking loops to lock laser frequencies to Fabry-Perot cavities, integrating RF modulation (EOMs), optical feedback, and active servo controls to suppress phase noise and achieve ultra-stable, narrow-linewidth operation.
- **Quantum Information Networks & Optics:** Leveraging cavity-stabilized light to isolate, control, and drive single-photon emission toward the development of scalable quantum information networks.

GenWright B Corp | *Engineering Intern*, New Haven, Connecticut

October 2025 – Present

- **Technical Research:** Investigating heat flux, R-values, and phonon movement in varying material shapes to optimize thermal efficiency in architectural applications.
- **Documentation:** Authoring comprehensive academic papers regarding the impact of material geometry on phonon movement, utilizing advanced calculus for thermal modeling.
- **Heat Diffusivity:** Developed a differential-equation model for effective heat diffusivity through material and insulation geometries to study how shape changes thermal performance.

Hoon Cho Lab (Yale School of Medicine) | *Research Assistant (Computational Biology)*, New Haven, Connecticut

December 2025 - April 2026

- **AI-Compiler Integration:** Integrating LLMs into the Shechi architecture to evolve the software into a high-performance, AI-driven compiler.
- **Compiler Research:** Integrated LLM components into the Shechi compiler architecture and developed security logic for automated vulnerability detection in genomic-data workflows.

University of Zawiyah College of Engineering | *Assistant Lecturer (CAD and Introductory English)*, Zawiyah, Libya

June 2023 – July 2024

- **Blueprint Development:** Developed detailed blueprints for student projects, ensuring clarity and precision in design execution.
- **Instruction:** Assisted in teaching parametric design and CAD courses, enhancing students' understanding of complex design principles.

LEADERSHIP

ARELIA Foundation | *Founder/ Chief Financial Officer*, Tripoli, Libya

July 2022 – Present

- **Established** and incorporated a global educational non-profit, drafting all articles of incorporation and bylaws to ensure long-term legal and operational viability.
- **Fundraising Success:** Spearheaded initiatives that secured approximately \$90,000 (800,000 LYD) in funding to expand educational access.
- **Scalable Impact:** Directed previous initiatives providing free English language education to 118+ underprivileged students, managing curriculum development and instructor recruitment.

ISM Tech Masters Robotics Team | *Founder/ Captain/ Mentor/ LYBOTICS & FIRST International Delegate*, Tripoli, Libya

October 2022– Present

- **Team Founding & Competition Leadership:** Founded ISM Tech Masters and led the team to two national finalist finishes in FIRST/LYBOTICS robotics competition.
- **Robotics Leadership & Representation:** Directed team strategy, design, and member development while serving as one of 15 primary liaisons between FIRST and LYBOTICS, supporting 140+ teams and 4,000+ members.

MakeHaven | *Sponsored Member / Volunteer*, New Haven, Connecticut

November 2025 – Present

- **Technical Authority:** Appointed as a Facilitator to manage shop floor operations and ensure safety/compliance for a community of makers and engineers.
- **Instructional Lead:** Conduct comprehensive onboarding and technical training for new members, specifically focusing on CAD/CAM workflows and 3D printing/additive manufacturing technologies.
- **Equipment Mastery:** Troubleshoot and maintain high-precision 3D printing hardware, providing guidance on material selection and print optimization.

PROJECTS

Electric Hacksaw | *Mechanical Design & Fabrication Project*, Libya

Summer 2023

- **Design & Fabrication:** Designed in CAD and fabricated a motor-driven hacksaw from purchased and scrap components; learned welding and built the frame and mechanism over approximately six weeks for faster, repeatable wood and plastic cuts.

PDH Lock Automation | *Cavity OptoMechanics Project*, Yale University, New Haven, CT

Summer 2026

- **Automation & Instrumentation:** Developed an automated Pound-Drever-Hall (PDH) laser-locking workflow using MokuLabs and Python, integrating signal acquisition, control logic, and tuning procedures to improve lock acquisition and stability for an experimental photonics system supporting single-photon research.

SKILLS

Technical: Python, Igor Pro, Microsoft Office Suite, SolidWorks (6 years), Onshape (6 years), LLM Integration, MasterCAM, AutoCAD, Codon, PDH-Locking

Languages: English, Arabic, Tamazight