

Abrian I. Abir

Mechanical Engineer & Programmer

865-232-3996 ♦ abrian.inbox@gmail.com
github.com/a-abir ♦ [Linkedin.com/in/a-abir](https://www.linkedin.com/in/a-abir)

EDUCATION

The University of Tennessee, Knoxville TN — Master of Science Expected Graduation: May 2026
MS. Mechanical Engineering GPA: N / A

The University of Tennessee, Knoxville TN — Bachelor of Science Graduation: May 2024
BS. Mechanical Engineering with a minor in Computer Science GPA: 3.99 / 4
Honors: Dean's List - Summa Cum Laude, 1794 Honors Scholar, Outstanding Senior & Junior in MABE, UT Lead

PUBLICATIONS

- **Additive Manufacturing, Volume 53** – Structural stability of thin overhanging walls during material extrusion additive manufacturing of thermoset-based ink
- **Additive Manufacturing, Volume 37** – Linking thermoset ink rheology to the stability of 3D-printed structures

SKILLS

Software Proficiency: Python | C++ | Java | MATLAB | FPGA VHDL | HTML & CSS
 Computer-Aided Design: SOLIDWORKS - CSWA CERTIFIED | Fusion360 | OnShape | Forming Suite
 Computer-Aided MFG: Laser Cutter | FDM | SLA & SLS 3D printing | CNC Mill and Router
 Finite Element Analysis: ANSYS & FLUENT | OpenFOAM | Autodesk Simulation | SOLIDWORKS Simulation

EXPERIENCE

- **Tokamak Probe Engineering Intern | Oak Ridge National Laboratory** | Oak Ridge, TN | May - Aug 2024
 - ♦ Engineered computational design tools for Plasma Facing Components (PFCs) utilizing CFD (ANSYS FLUENT/OpenFOAM), FEA (ANSYS/OpenFOAM), and plasma heat load software (HEAT/SMITER).
 - ♦ Optimized probe design to achieve high heat flux tolerance, minimized cooling water pressure drop, compact size, and resilience against extreme disruption electromagnetic loads.
- **Fuel Performance & Design Intern | GE Hitachi Nuclear Energy** | Wilmington, NC | May - Aug 2023
 - ♦ Created a database of high-residence time failure bundles in 5+ boiling water reactors with data analysis tools
 - ♦ Conducted risk assessment and failure analysis of various reactor cycles using thermal-mechanical models
 - ♦ Presented findings and provided progress updates in collaboration with the thermal-mechanical team.
- **Senior Design Project | Eastman Chemical Company** | Kingsport, TN | Aug 2023 - May 2024
 - ♦ Developed and implemented a control system for automating the separation of large rolls of film and liner.
 - ♦ Led the programming in C++ of a dynamic roller adjustment system with changing diameter.
- **Undergraduate Research Assistant | University of Tennessee** | Knoxville, TN | Aug 2020 - May 2023
 - ♦ Conducted research in a laboratory setting, assisting with experiments and projects focused on 3D printing
 - ♦ Utilized CAD to design and test 3D-printed parts for experiments, including structural and thermal analysis
 - ♦ Created software for data collection and analysis during the 3D printing processes, utilizing Python and C++
 - ♦ Assembled fixtures and conducted 3-point flexural tests to evaluate the material properties of printed parts
- **Undergraduate Teaching Assistant | University of Tennessee** | Knoxville, TN | Aug 2021 - May 2023
 - ♦ Collaborated with professors to develop lab assignments and projects focused on MATLAB and technical skills
 - ♦ Provided individualized support to students with programming challenges and project-based inquiries
 - ♦ Evaluated projects and assessments for multiple lab sections with over 60 students
- **Research Intern | Dr. Compton's Research Group** | Knoxville, TN | Aug 2018 - May 2020
 - ♦ Developed machine-vision application for automating data collection and analysis of 3D printing experiments
 - ♦ Created desktop applications in Python to standardize analysis and visualization of tensile test data
 - ♦ Collaborated with 6+ Ph.D. and graduate students and actively supported 3+ publications efforts.
- **Robotics Team Lead | Soknorobo-FRC** | Knoxville, TN | Aug 2016 - May 2020
 - ♦ Led a team of ~10 designing, constructing, and coding robotic subsystems for competitions, utilizing Fusion 360 and various manufacturing methods (CNC router, laser cutter, 3D printing, etc.)
 - ♦ Taught programming and engineering curriculum with 30+ students, with hands-on activities and projects.
 - ♦ Built and maintained the robotics team portfolio website, utilizing HTML, CSS, and Javascript

AWARDS AND ACHIEVEMENTS:

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- Outstanding Senior and Junior in Mechanical Engineering (the Tickle College of Engineering)
 - Robert H. Leonard Service to Humanity Award (the Optimist Club of Knoxville)
 - Captain Marcus Alford Memorial Award
 - Sergeant Eric Fifer Memorial Award

PERSONAL PROJECTS

Mini-bot Curriculum: Developed robotics library, documentation, and curriculum for engineering course.
Vision processing Workshop: Led robotics and machine vision techniques, providing hands-on training.