Baaqer Farhat

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Summary

Passionate about robotics engineering, with a track record of leadership in international competitions and prestigious awards. Particularly interested in robots/manufacturing, controls, EVs, and mechatronics.

EDUCATION

California Institute of Technology — **Pasadena, CA**
EE / Robotics Engineering with minor in Control Systems and Dynamics — *Sept 2023 - Present*

SKILLS

- CUDA/Pytorch
- 3-D printing
- Solidworks/Fusion/Onshape
- Robot Arms (FANUC)
- Altium/KiCAD: PCBs
- Isaac Sim/Lab
- PID/MPC/LQR
- Wiring/Electronics
- Microcontrollers
- Python/Java Programming
- ROS1 and ROS2
- Soldering / Quick Prototyping
- PLC Programming
- CNC Machining
- Communication/Leadership

HIGHLIGHTED COURSE WORK

- **ME/EE/CS 133**: Kinematics and Dynamics
- **ME 169**: Mobile Robot Localization/Navigation
- **ME 13**: Prototyping (Solidworks and CNC)
- **EE 13/23**: Electronic Systems Prototyping
- **Altium Training**: Caltech Racing (FSAE) Team
- **CS 1/2**: Python and Java Programming
- **EE 150**: Deep Learning
- **Android App Development:** Java
- **EE 44/55:** Advanced Circuit Analysis
- **CS 156:** Machine Learning

Internships and Awards

- **Reserach Intern in Autonomous Robotics Lab at Caltech (Summer 2025)**: Developing a closed-loop VIO pipeline for a spacecraft simulator, using a multimodal Transformer to perform real-time fault detection and identification.
- **Avalon Robotics Engineering Internship (Spring 2024)**: Worked on autonomous manufacturing through mechatronics projects and FANUC Robot arm
- **CPS Office of Computer Science Robotics Summer Internship (Summer 2023)**: Group leader for building and programming a mecanum robot chassis
- **Morningstar Summer Internship (Summer 2022)**: Front-End Developer on Institutional products team
- **United by STEM: One Team, Two Continents (Fall 2023)**: Robotics mentoring in South Africa
- **FIRST Robotics**: Deans List Award (Midwest): First place in State for student leaders
- **2x FTC Chicago City Championship (robotics)**: B est FTC team in City
- **FTC Chicago City Control Award** : M ost advanced robot design
- FRC Midwest Regional Judge Award and Inspire Award

Projects

- Publishing paper for Fault Detection and Identification in Spacecraft Simulator Lab
- ROS2 Autonomous Robot Explorer and Navigator
- ROS2 Fly Swatter Robot Arm
- Developed a Micro-Stompy Humanoid Robot from scratch as part of a startup initiative with K-scale, designed for a low-cost humanoid and ReelSteel-inspired boxing competition.
- RFID Invetory System for autonomous manufacturing
- Automatic Coolent/water Pump for CNC automation through PLC NEXTEngineer
- Multipurpose probe (Designed Schematic, PCB, and Assembled)
- PID Self Balancing Robot (built + optimized with simulations)
- FTC Cone Delivery Robot: Odometry localization
- International Robotics Mentor Through One Team, Two Continents Project