

Zijun (Eric) Xu

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EDUCATION

Johns Hopkins University

B.S. in Mechanical Engineering & M.S.E. in Robotics (combined BS/MS) | GPA: 3.74

Baltimore, MD

Aug 2025 – May 2029

TECHNICAL SKILLS

Programming Languages: Python, C++, C

Embedded Systems & Microcontrollers: Raspberry Pi, Arduino, PCB Design, Power Distribution

Robotics & Simulation: ROS/ROS2, SLAM, MuJoCo, Gazebo, Motion Planning, PID Control, Sensor Fusion, Computer Vision, 3D Point-Cloud Registration, PyTorch, OpenCV, CUDA, Model Training & Evaluation

Mechanical Design & Fabrication: AutoCAD, SolidWorks, FEA, DFM/DFA, GD&T, CNC Machining, Injection Molding, Silicone Casting, Spin Coating, 3D Printing, Lathe & Mill Operations, Laser Cutting

Developer Tools: Git/GitHub, Linux/Ubuntu, Visual Studio Code

EXPERIENCE

Research Engineer

Sep 2026 – Present

Sci-Phy Lab (PI: Prof. Krishna Murthy Jatavallabhula), Johns Hopkins University

Baltimore, MD

- Assembled and calibrated the CRAFT tendon-driven anthropomorphic hand (15 DYNAMIXEL actuators, hybrid rigid-soft compliant joints) and integrated vision-based teleoperation (FrankMocap + HaMeR) for single-camera whole-hand control, benchmarking grasp performance across the Feix taxonomy
- Fabricated a soft pneumatic finger with embedded strain sensors via silicone casting and custom PCB assembly for real-time proprioceptive shape estimation; currently integrating a custom multimodal tactile sensing layer for closed-loop contact/force feedback

Co-Founder & Robotics Engineering Lead

Sep 2025 – Present

TraceCams; Pava Center, Spark Accelerator Program

Baltimore, MD

- Designed and manufactured 6-DOF CNC aluminum robotic arm (1.6m span, 10kg payload) with cycloidal drive actuators, iterating across 5 hardware generations from 3D-printed prototype to production-grade design
- Implemented full control stack including gravity compensation, impedance control, inverse kinematics, and trajectory planning; enabled lead-through programming with sub-centimeter path repeatability
- Developed MuJoCo sim-to-real pipeline for pre-deployment control algorithm validation, reducing iteration time and hardware testing risk

Research Engineer

Dec 2025 – Present

IMERSE Lab (Intelligent Medical Robotic Systems & Equipment), Johns Hopkins University

Baltimore, MD

- Designed and trained a two-stage U-Net segmentation pipeline (0.842 Dice) to localize tumor resection margins in real-time endoscopic video, reducing under- and over-resection risk during tumor removal
- Built an automatic tool-tip tracking pipeline (Keypoint R-CNN + SAM2 refinement) and a geometric cutline-sweep algorithm to track resected tissue in real time, deployed on the Virtuoso/KUKA surgical robot during live CAO procedures to flag off-target cutting into healthy tissue; preparing for IPCAI/IJCARS submission

Research Engineer

Aug 2025 – Present

Terradynamics Lab (PI: Dr. Chen Li), LCSR, Johns Hopkins University

Baltimore, MD

- Developed a closed-loop, multi-motor control algorithm that uses current and speed feedback to autonomously detect leg jams & drive a cockroach-inspired robot to roll across potential energy barrier, improving autonomous beam-traversal success from 0% to 85%
- Fabricated and calibrated a coin-sized 6-axis capacitive force/torque sensor (CoinFT) via silicone pillar casting and custom PCB assembly; trained a PyTorch MLP to map raw capacitance channels to full wrench output

PROJECTS & COMPETITIONS

SkyCatcher Delivery Drone - Designer & Engineer | ISEF 2024 - 4th Place Award

Jun 2023 – May 2024

- Designed and manufactured SkyCatcher, a retractable ring-shaped delivery drone; prototyped slide-rail mechanism achieving 46% size reduction through iterative CAD modeling, 3D printing, and carbon fiber layup
- Integrated LiDAR, onboard computing (Intel NUC), flight controllers, and battery management systems; achieved autonomous navigation through SLAM for warehouse delivery applications

F1Tenth Autonomous Racing - Team Leader | IEEE SM Conference - 3rd Place

Jun 2024 – Sep 2024

- Led team to design & race two autonomous 1/10-scale vehicles with LiDAR-based Pure-Pursuit planning; achieved 2nd fastest lap (9.18s) and 3rd place overall as only high school team among 12 international university competitors
- Designed custom carbon fiber chassis in SolidWorks and engineered PCB for motor power distribution; performed rapid troubleshooting of electrical systems under competition pressure to restore vehicle functionality