Arsalan Ahmed

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Education

University of California, Davis **Jun 2025**

Bachelor of Science, Electrical Engineering Relevant Coursework: Machine Learning,CircuitFabrication, GPA: 3.45 *Davis, CA*

Relevant Experience

Microfabrication Research Intern **Jun 2025 – Sep 2025**

University of California, Davis *Davis, CA*

- Operated in a cleanroom environment to view and fabricate semiconductor devices using techniques such as etching, allignment, exposure and deposition.
- Characterized resistors, capacitors, inductors, and photosensors using electrical measurements and scanning electron microscopy; analyzed device structure and performance against theoretical models.
- Researched photovoltaic device fabrication and testing, with a focus on solar cell materials and doping profiles.

Robotics Production Intern **Jun 2024 – Jun 2025**

Barobo Inc. *Sacramento, CA*

- Designed and optimized PCB layouts in **Altium Designer**, improving circuit efficiency and compatibility.
- Assembled and soldered 1000+ programmable circuit boards and robots, ensuring **100% functionality** after testing.
- Streamlined testing, debugging and packaging processes for electronic motherboards and Arduino kits to reduce defects.
- Managed robot shipments, increasing logistics efficiency through improved inventory tracking.

Software Engineer Fellow **Jun 2024 – Aug 2024**

Headstarter AI *San Francisco(Remote), CA*

- Built 5 projects using React JS, Next.js, and Vercel and incorporated CICD practices for iterative development.
- Participated in weekly sessions with engineers from Google, Y Combinator, Amazon, and venture-backed startups.

Projects

Autonomous Vehicle Design | **OpenMV, PWM, Custom PCB**

- Developed an autonomous RC vehicle using camera-based lane detection with OpenMV, real-time PWM motor/servo control, and a custom vision algorithm based on dual-region blob tracking.
- Designed and tested a custom motor control PCB using H-Bridge and MOSFET drivers for brushed DC motor control.
- Implemented filtered position/angle tracking and adaptive speed control, achieving consistent lap completion with a best time of 48 seconds.

Deep Learning Vehicle Classifier | **PyTorch, ResNet18**

- Developed a deep learning vehicle classification system, implementing a custom PyTorch Dataset class, data augmentation techniques, and transfer learning with ResNet18.
- Optimized model performance through hyperparameter tuning (learning rate, batch size), and advanced visualization techniques including confusion matrices, per-class accuracy metrics, and confidence-based prediction analysis.
- Improved classification accuracy by **20%** through model fine-tuning and augmentation strategies.

Multi-Object Tracking System with YOLO | **YOLOv3**

- Integrated YOLOv3 for object detection and centroid extraction, enabling real-time identification and tracking of multiple objects within video frames.
- Developed a custom centroid-based tracking system with unique ID assignment, dynamic object registration, and trajectory visualization for robust multi-object tracking.
- Achieved a **30% reduction in tracking errors** by refining object association algorithms.

Handheld Console Design using Raspberry Pi | **Raspberry Pi**

- Designed and engineered a versatile handheld portable PC capable of running Windows and retro console games.
- Utilized cutting-edge components including Raspberry Pi, compact battery, and common handheld parts.

Technical Skills

Languages: C++, Python, HTML, MATLAB, LaTeX, Verilog, RISC-V
Developer Tools: Visual Studio, Jupyter Notebook, Eclipse IDE, Silvaco, Intel Quartus, Jira
Technologies&Frameworks: React JS, Next.js, Vercel, PyTorch, ResNet18, YOLOv3, Altium, Revit