Sanjot S. Bains

sanjotbains@gmail.com | (209) 648 - 6421 | linkedin.com/in/sanjot-bains | github.com/sanjotbains

Summary

Electrical Engineering graduate with hands-on expertise in embedded systems, robotics, and electromechanical repair. Combines theoretical training with practical problem-solving skills honed through automotive, fabrication, and autonomous vehicle projects.

Education

University of California, Santa Barbara, BS in Electrical Engineering — Sept 2019 – June 2025

- GPA: 2.92 (*3.64 last 3 quarters*)
- **Coursework:** Digital Signal Processing, Digital Communications, Embedded Systems
- **Distinctions:** Admitted as Regents' Scholar, Dean's List Winter 2025
- 3rd Place, HFA Creativity Contest (Prose), 2025

Projects

Senior Capstone Project: Autonomous Racing — github.com/ray-quasar

- *Software Architecture:* Designed and implemented complete ROS2-based autonomous racing stack for F1TENTH platform, featuring real-time LiDAR processing, dynamic speed profiling, and safety-critical control systems
- *Advanced Perception & Planning:* Developed novel disparity extender algorithm using vectorized NumPy operations, enabling high-performance obstacle detection and path planning with parametric speed control for racing conditions
- *Human-Machine Interface Design:* Built comprehensive teleoperation and testing framework with game controller integration, real-time visualization tools, and configurable safety systems for autonomous vehicle development

Experience

Heavy-Duty/Trailer Mechanic, Bains Transport, Inc. – Turlock, CA — 2016 – Sept 2023

- Diagnosed and repaired electrical/mechanical failures in heavy machinery (e.g., tractors, forklifts).
- Fabricated and welded (SMAW, GMAW, GTAW) custom parts for equipment modifications.
- Troubleshot hydraulic and pneumatic systems, demonstrating strong analytical skills.

Handyman/Repairman, Self-Employed – Turlock, CA — 2018 – present.

- Designed and built custom structures (e.g., sheds, racks, cabinetry) using carpentry and metalworking skills.
- Repaired household electrical systems (e.g., wiring, outlets) and appliances.
- Created architectural schematics, filed for building and electrical permits.

Board Member, Sikh Student Association – Santa Barbara, CA — Sept 2023 – June 2025

- Led biweekly meetings discussing Sikh theological and philosophical topics. Wrote original reading materials and facilitated inclusive discussion.
- Organized yearly *Langar* community kitchen event, coordinating transport, budgets, and *THE DISTRIBUTION OF LITERALLY HUNDREDS OF POUNDS OF FOOD*.
- Coordinated with national organization United Sikh Movement to develop leadership skills and train new members.

Technologies and Skills

Languages: Python, MATLAB, C/C++

Technologies: ROS2, AutoCAD, Fusion, Vitis, Ollama, LaTeX

Mechanical Systems: Hydraulics, pneumatics, machining, welding (SMAW/GTAW/GMAW), fabrication.

Electrical: PCB design, wiring, soldering, motor controls.

Tools: Oscilloscopes, multimeters, 3D printing, machining (manual/CNC), hand/power tools.