Utkrisht Batra

Pomona, CA | 925-482-4390 | ubatra01@gmail.com | linkedin.com/in/utbatra | utbatra.com
U.S. Citizen | Clearance Eligible

Summary

Electromechanical Engineering Technology senior building across robotics, automotive systems, mechanical design, and simulation. Strongest in hands-on hardware integration, diagnostics, validation, and troubleshooting: Jetson/ROS 2 AI camera payloads, automotive electrical systems, gearbox prototypes, CFD workflows, and thermal simulation. Seeking test, integration, embedded, or validation engineering roles.

Skills

Electrical & Test: DMM, oscilloscope, wiring harnesses, soldering, crimping, 12V power systems, sensors, actuators, root-cause analysis
Embedded & Robotics: ROS 2, Jetson Orin Nano, Raspberry Pi, Arduino, PWM servo control, I2C, camera integration, embedded Linux
Mechanical & CAD: SolidWorks, ANSYS Fluent, SpaceClaim, 3D printing, lathe, mill, drill press, tolerance analysis, GD&T basics
Programming: Python, C/C++, MATLAB, Linux, shell scripting
Methods: Prototyping, hardware bring-up, system integration, troubleshooting, AGMA gear analysis, technical documentation

Education

California State Polytechnic University, Pomona — Expected May 2026
Bachelor of Science, Electromechanical Engineering Technology — *Dean's List, Spring 2025*

- Coursework: Instrumentation & Control, Machine Elements, Robotics Control, Applied CFD, Manufacturing Systems

Projects

AI Pan/Tilt Camera Tracking System for BillyBOT | *Jetson Orin Nano, ROS 2, PCA9685* — Jan 2025 – Present
- Integrated Jetson Orin Nano, Arducam IMX477 camera, PCA9685 PWM driver, and pan/tilt servos into an offline person-tracking prototype for BillyBOT
- Performed hardware bring-up across camera input, I2C servo control, ROS 2 nodes, power delivery, and software-enforced pan/tilt motion limits
- Validated scan-run behavior with 8.38 FPS average, 7/7 servo tests passed, and 0 out-of-bounds servo commands during poster verification

W124 E320 Aerodynamic CFD Analysis | *ANSYS Fluent, SpaceClaim, RANS k-ε* — Oct – Dec 2025
- Ran complete solo ANSYS Fluent CFD workflow including geometry cleanup, half-car domain setup, meshing, boundary conditions, solver setup, and post-processing
- Compared stock and modified bumper aerodynamic behavior using pressure/velocity contours and drag coefficients; modification was aerodynamically neutral

Two-Stage Gearbox Design & Physical Prototype | *SolidWorks, AGMA, 3D Printing* — Aug – Dec 2024
- Led mechanical design and validation of a two-stage gearbox using AGMA bending/contact stress checks, SolidWorks assembly modeling, and 3D-printed prototype testing
- Verified gear fitment and drivetrain motion through physical prototype assembly, identifying tolerance and meshing behavior beyond calculations alone

Heat Sink Fin Design & ANSYS Thermal Simulation | *ANSYS Thermal, Analytical Fin Theory*
- Verified analytical thermal resistance of 1.249 °C/W against ANSYS result of 1.210 °C/W, achieving about 3.12% agreement
- Used Biot number checks, mesh refinement, and path-plot comparisons to validate that simplified fin assumptions were physically reasonable

Experience

Robotics Systems Integration and Test Assistant — Sep 2025 – Present
Cal Poly Pomona – BillyBOT Autonomous Campus Guide Robot — *Pomona, CA*
- Perform hardware bring-up and cross-system integration on BillyBOT, an autonomous campus guide robot with motor, LiDAR, GPS, ultrasonic, and AI vision subsystems running ROS 2
- Integrate a Jetson Orin Nano AI camera payload onto the robot platform, verifying camera operation, pan/tilt actuation, and scan-run behavior

Independent Hardware Integration Consultant — Aug 2019 – Sep 2023
WC Stereo Installers — *Walnut Creek, CA*
- Built and troubleshot 15+ vehicle electronic systems involving amplifiers, DSPs, OEM signal integration, wiring harnesses, grounding, and power distribution
- Diagnosed electrical noise, signal faults, and integration issues using DMM/oscilloscope measurements, wiring schematics, and methodical fault isolation