

Utkrish Batra

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Summary

Electromechanical engineering senior with hands-on experience across embedded systems, electrical integration, and mechanical prototyping. Currently integrating an AI vision system onto an autonomous robot platform at Cal Poly Pomona. Four years of independent hardware consulting. Seeking test, integration, embedded, or validation roles.

Skills

Electrical & Test: DMM, oscilloscope, circuit analysis, wiring harnesses, soldering, crimping, CAN bus, 12V power systems
Embedded & Robotics: ROS 2, NVIDIA Jetson Orin Nano, Raspberry Pi, Arduino, Odroid, PWM motor control, sensor interfacing
Mechanical & CAD: SolidWorks, ANSYS Fluent, SpaceClaim, 3D printing, lathe, mill, drill press, tolerance analysis
Programming: Python, C/C++, MATLAB, Linux, shell scripting
Methods: Prototyping, hardware bring-up, system integration, troubleshooting, AGMA gear analysis, technical documentation

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
 - Debug embedded device communication and verify subsystem coordination across sensors, actuators, and controllers during integration testing
 - Integrate a Jetson Orin Nano AI camera module onto the robot platform, confirming real-time tracking and pan/tilt actuation for campus demonstrations
- Independent Hardware Integration Consultant** Aug 2019 – Sep 2023
WC Stereo Installers Walnut Creek, CA
- Designed and installed 15+ custom automotive electronic systems including amplifiers, DSP units, wiring harnesses, and sensor integrations across diverse vehicle platforms
 - Diagnosed electrical faults using DMM and oscilloscope, performing root-cause analysis and implementing grounding strategies to resolve EMI and signal integrity issues
 - Bypassed OEM CAN bus constraints with custom harness solutions while retaining factory functionality and ensuring long-term system reliability

Projects

- Offline AI Person-Tracking Camera** | *Jetson Orin Nano, ROS 2, Python, Edge ML* Jan 2025 – Present
- Built an offline AI person-tracking camera through three hardware revisions (Pi 3, Pi 5, Jetson Orin Nano), achieving 12–18 FPS real-time detection with zero cloud dependency
 - Implemented pan/tilt servo actuation with PWM motor drivers and closed-loop tracking feedback, tested under varied lighting and distance conditions
- Two-Stage Gearbox Design and Prototype** | *SolidWorks, AGMA Analysis, 3D Printing* Aug 2024 – Dec 2024
- Led a Machine Elements team in designing a 35:1 two-stage reduction gearbox using AGMA bending and contact stress analysis with fatigue life calculations
 - Modeled full assembly in SolidWorks and 3D-printed physical prototype, confirming drivetrain motion and gear meshing under load
- Solo CFD Analysis – Mercedes-Benz E320** | *ANSYS Fluent, SpaceClaim, RANS $k-\epsilon$* Oct 2025 – Dec 2025
- Executed a solo ANSYS Fluent aerodynamic study from geometry cleanup through meshing, simulation, and post-processing – a scope typically split across a 4-person team

Education

- California State Polytechnic University, Pomona** Expected May 2026
Bachelor of Science, Electromechanical Engineering Technology
- Coursework: Instrumentation & Control, Machine Elements, Robotics Control, Applied CFD, Electronic Systems, Manufacturing Systems, Lean Manufacturing
 - Dean's List (Spring 2025) | President's List, Diablo Valley College (Fall 2020)

Certifications & Leadership

- Getting Started with ANSYS Fluent – Ansys (Dec 2025)
Scholarship Chairman, Sigma Chi Fraternity – Cal Poly Pomona (Fall 2023 – Spring 2024)