

Lek Man

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SUMMARY

Aerospace Engineering student at UC San Diego focused on UAVs, mechatronics, robotics, and autonomous flight systems. Hands-on builder across full hardware and software stacks: CAD, composite and mechanical fabrication, embedded firmware, control tuning, avionics integration, and flight-test execution.

EDUCATION

University of California, San Diego

La Jolla, CA | 2024-Present

B.S. Aerospace Engineering, GPA: 3.4

Christian Alliance International School

Hong Kong | 2018-2024

High School GPA: 3.75

TECHNICAL SKILLS

- **Programming:** Python, C/C++, C, JavaScript, MATLAB
- **Embedded Systems:** ESP32, STM32, Arduino, Raspberry Pi, I2C/UART/CAN, UDP telemetry links
- **Flight/Controls:** ArduPilot, Betaflight, ELRS, PID tuning, FOC motor control, sensor calibration, HIL testing
- **CAD/Hardware:** Onshape, Fusion 360, SketchUp, SolidWorks (basic), carbon-fiber/composite layup, 3D printing, laser cutting, soldering
- **Tools:** Git/GitHub, OpenCV, VESC toolchain, Altium (basic PCB design)

PROJECTS

Autonomous Quadcopter Flight Test Platform

Jun 2025-Present

- Designed and built a complete 10-inch UAV from first principles: carbon-fiber frame architecture, custom landing gear, and dedicated mounts for gimbal and Jetson-class onboard compute.
- Engineered full 8S propulsion and powertrain stack (motors, ESCs, power distribution, and wiring harness), then performed full avionics integration and electrical validation.
- Executed end-to-end ArduPilot bring-up including sensor setup, frame/actuator mapping, failsafe configuration, PID tuning, and autonomous guided takeoff validation.
- Used the platform as a repeatable flight-test asset for integration debug and subsystem verification prior to competition-focused deployment.

Autonomous Antenna Tracker

2025

- Built a dual-axis long-range tracking system to maintain aircraft-ground link alignment using live GPS telemetry and onboard heading estimation.
- Developed ESP32 firmware for real-time pointing control, integrating GPS and magnetometer data over I2C and telemetry channels.
- Improved heading and pointing accuracy with a Python ellipsoid-fit magnetometer calibration pipeline.

2-Axis Camera Gimbal

2025

- Developed STM32-based ESC firmware using FOC + PID closed-loop control with encoder feedback for precision stabilization.
- Integrated IMU sensing, CAN communication, and vibration-isolated mechanical structures for robust onboard imaging during UAV motion.

Quadcopter Development (Iterative Builds)

2024-2025

- Designed and built multiple UAV configurations including 3D-printed prototypes, carbon-fiber racing builds, and long-range FPV systems.
- Configured flight controllers, tuned PID loops using blackbox-style analysis workflows, and optimized powertrain efficiency across iterations.

CNC Drawing Machine

Portfolio Project

- Built an Arduino GRBL-based pen plotter with a custom Python/OpenCV image-to-G-code pipeline for automated vector drawing.
- Designed motion subsystem with microstepped steppers and precision rails; tuned firmware and kinematics for drawing repeatability.

Ball-Balancing Robot

Portfolio Project

- Built a dual-axis balancing platform using Raspberry Pi + OpenCV visual tracking and Python PID loops for real-time stabilization.
- Integrated servo actuation, frame prototyping, and CV feedback to close the loop between perception and motion control.

Autonomous Robot Turret

Portfolio Project

- Developed a vision-guided 3-DOF mechatronic turret integrating embedded control, custom motor-driver electronics, and safety logic.
- Implemented modular software and hardware architecture for reliable targeting demonstrations and STEM outreach use.

EXPERIENCE

UAV Systems Integration Engineer, Triton Unmanned Aerial Systems (UCSD)

Sep 2024-Present

- **Role progression:** started as cross-functional mechanical/electrical/software contributor; expanded into aircraft-level systems integration ownership across the flight stack.
- Designed and integrated mission-critical UAV subsystems including powertrain architecture, avionics layout, and integration interfaces between propulsion, sensing, and control.
- Configured and debugged ArduPilot and Betaflight environments across fixed-wing and quad platforms, including calibration, mode logic, failsafes, and control-loop tuning.
- Developed and integrated firmware for supporting systems (antenna tracker, gimbal-adjacent modules) and improved reliability through iterative bench and field validation.
- Implemented computer-vision-assisted localization workflows, including image-offset to GPS coordinate estimation for mission support tooling.
- Designed an IMU breakout PCB (ICM-40690 class sensor integration) and incorporated hardware-in-the-loop style validation during subsystem bring-up.
- Performed composite airframe fabrication (fiberglass/carbon-fiber layup), designed and fabricated custom structural and vibration-isolated mounts, and supported rapid mechanical iteration.
- Coordinated preflight checks and test-flight execution workflows, driving integration closure from lab bring-up to takeoff-ready aircraft.
- Contributed to SUAS mission outcomes (Top 25% team placement; top 20% mission demonstration score among 81 teams).

Founder & President, Mechanical Engineering Club

Sep 2022-Jun 2024

- Grew club to 20+ active members; organized engineering events and cross-team build projects.
- Secured funding, managed planning/execution, and mentored younger students in hands-on builds.

Member, Existential Robotics Laboratory (UC San Diego)

2025-Present

- Contribute to research prototyping with hands-on mechatronic integration, experimental setup, and iterative validation workflows.
- Support cross-disciplinary robotics development spanning mechanical assemblies, embedded electronics, and system-level testing.

Engineering Intern, CYC Motors

Jul 2023-Aug 2023

- Assembled and soldered BLDC motor testing stands for controlled performance and durability evaluation.
- Executed test campaigns with VESC tooling, collected and analyzed motor data, and provided engineering feedback for product optimization.
- Supported IQC/OQC quality-control workflows and authored SOP documentation to improve test consistency and onboarding.

Student Presenter, ACAMIS Technology Conference

Mar 2023

- Delivered a student technical presentation on technology-enabled learning to educators and school administrators.

Main Designer, Greendeck VR Competition Team

2021-2022

- Co-designed an interactive 3D VR green-deck model in a 4-student team, using Unity and SketchUp workflows.
- Won overall championship among participating schools.

AWARDS

- SUAS 2025: Top 25% placement (UC San Diego team).
- Cayley Contest 2022: Top 25% globally, school grade champion.
- Greendeck VR Competition 2021-2022: Champion.