

ERIC J. DEAN

Half Moon Bay, CA | 650-457-4117 | ericjamesdean1@gmail.com
linkedin.com/in/edean07 | github.com/XrxcGH | he/they

SUMMARY OF QUALIFICATIONS

Eric Dean is a mechanical engineering student at UCLA and is currently interning at the Western Region Robotics Forum (WRRF). His engineering experience spans mechanical design and CAD, electrical assembly and controls, and programming. He completed four competition seasons in *FIRST*® Robotics Competition, first as a founding member and Team Captain and now as a mentor to students across the San Francisco Bay Area.

His technical work covers machining and parts fabrication, swerve drivetrains and mechanism design, computer vision and AprilTag localization, autonomous path planning, and robot electrical systems. He has taught robotics and programming to students aged 10 to 17 as an instructor at iD Tech, and has authored technical training curricula, competition rule packages, and operations documentation for a regional robotics nonprofit. Robotics software projects also include the use of AI platforms, starting with written specifications and followed by architecture decisions, code review, and hands-on testing.

Alongside the technical work, he led the business side of a competition robotics program, covering fundraising, sponsorship development, budgeting and organizational documentation, and is currently founding Groundwork Robotics, a robotics education nonprofit seeking 501(c)(3) status. His longer-term goal is to pair hands-on engineering with engineering and business management.

EDUCATION

University of California, Los Angeles

Los Angeles, CA

Bachelor of Science, Mechanical Engineering

September 2025 to expected June 2029

Coursework completed and in progress:

- **CHEM 20A, 20B:** Chemical Structure; Chemical Energetics and Change
- **EPS SCI 17:** Dinosaurs and Their Relatives
- **GEOG 4:** Regional Development and World Economy
- **MATH 31A, 31B:** Differential and Integral Calculus; Integration and Infinite Series
- **MATH 32A, 32B:** Calculus of Several Variables
- **MECH&AE M20:** Introduction to Computer Programming with MATLAB
- **MECH&AE 101:** Statics and Strength of Materials
- **PHYSICS 1A, 1B:** Mechanics; Oscillations, Waves, Electric and Magnetic Fields
- **PHYSICS 4AL:** Physics Laboratory: Mechanics
- **STATS 10:** Introduction to Statistical Reasoning

Activities: ASME at UCLA (American Society of Mechanical Engineers); Westwood SolidWorks User Group

Archbishop Riordan High School

San Francisco, CA

Diploma, Magna Cum Laude

August 2021 to May 2025

4.321 GPA weighted, 3.968 unweighted (4.000 scale)

11 Advanced Placement and honors subjects, the maximum allowed: AP Calculus BC, AP Physics C: Mechanics, AP Computer Science Principles, AP Statistics, AP Calculus AB, AP English Language and Composition, AP United States History, AP Biology, AP World History: Modern, World Literature Honors, and Introduction to Composition/Literature Honors

Four-year Engineering Program: Engineering Essentials, Introduction to Engineering Design, Civil Engineering and Architecture, and Engineering Capstone

PROFESSIONAL EXPERIENCE

Western Region Robotics Forum

Intern

San Jose, CA

May 2026 to Present

WRRF runs off-season events and support programs for *FIRST*® Robotics Competition teams across the western United States. My work there covers event operations, documentation, and software.

- Authored the proposed CalGames 2026 event modification package, which amends the official *FIRST*® Robotics Competition game manual for a 40-team off-season event. It covers officiating and conduct, a streamlined safety inspection that replaces full *FIRST*® inspection with a safety self-certification and visual check, an additional weight allowance for between-match repairs, and exhibition match formats.
- Built the run of show for the event: more than 75 matches over three days for a 40-team field at 6 robots per match, validated against 9 to 10-minute qualification turnarounds, a 7-minute practice cadence, a 13-minute playoff cadence, and a venue that cannot be set up until after the school day ends.
- Designed the organization's Google Workspace architecture and the plan to migrate onto it: domains and licensing, organizational units, groups and email addresses, ten shared drives with full folder trees, a permissions matrix, naming conventions and a retention schedule, all mapped to the structure of the new website.
- Produced the accompanying migration runbook: a phased 90-day rollout, a security baseline, onboarding and offboarding checklists, and a risk register. It shipped with a browsable interactive HTML wireframe and a ten-tab XLSX build tracker covering all 182 folders, both generated by Python from one shared folder-tree definition.
- Built the organization's proposed website application in Node.js and Express, with contact forms, site-wide search, event and personnel management, a password-protected staff area, and a document library supporting upload, download, replace, and delete with public or staff-only visibility.
- Wrote and taught the FRC electrical training curriculum, both the basic and advanced sessions. It is written for everyone on a team rather than only the electrical subteam, and covers the hazards of a 12V system delivering several hundred amps, component identification, the power path from battery to motor and the signal path from driver station to motor controller, crimp and wire-routing standards, and first-line triage of a robot that will not move.
- Contributed to CalGames 2026 event planning, including pit and field scheduling, load-in logistics, volunteer staffing, and inspection workflow.

iD Tech

Instructor

Stanford, CA

June 2026 to August 2026

- Taught weeklong, full-day robotics and programming courses on the Stanford University campus, in small groups, to students aged 10 to 17.
- Ran BattleBots® Camp with VEX Robotics (ages 10 to 12) and BattleBots® Camp: Robotics Engineering with VEX (ages 13 to 17). Students build a robot from VEX V5 and VEX IQ parts, design their own attachments such as claw arms and battering rams, work to the design standards set by BattleBots engineers, and run the machine through driving challenges, time trials, and a final bracket.
- Ran Python Coding 101 (ages 10 to 12): variables, user input, conditionals, functions, lists and libraries, progressing to console games and then 2D arcade games in PyGame Zero, with custom pixel-art sprites made in Piskel, movement mechanics, and collision detection.
- Built iD Tech Watch, a classroom management system for camp labs. Instructors can view the open windows on every laptop in the room, close unauthorized applications, block games and gaming sites, pause screens, rename machines to the current week's students, and schedule daily events, all administered from a web panel organized by location, building, class, and computer.

Academy of Volleyball

Assistant Coach, U12 Girls Premier

Redwood City, CA

December 2024 to May 2025

- Planned and ran drills for practice sessions across the competitive club season.
- Supported tournament match warm-ups and in-match gameplay coaching.

ENTREPRENEURSHIP AND BUSINESS EXPERIENCE

Groundwork Robotics

Half Moon Bay, CA

Founder

August 2026 to Present

- Founding a nonprofit organization (seeking 501(c)(3) status) to train and support the students, mentors, coaches, and volunteers behind competitive robotics.
- Starting as a learning, training, and document repository platform, with planned expansion into hosting *FIRST*® Tech Challenge and *FIRST*® Robotics Competition events, running conferences and seminars, and connecting students and teams with the mentors and resources needed to succeed and grow.
- The long-term goal is a community Learning Center providing a full machine shop and practice field space.
- Built the organization's public website and staff content management system, along with a brand package and a document generation toolchain.

Armor Robotics / 9143, *FIRST*® Robotics Competition

San Francisco, CA

Team Captain and Founding Member

January 2022 to June 2025

- Grew the program from a school club to a competitive team and then to a recognized co-ed non-athletic varsity sport, working with school administration on recognition, student recruiting, and parent volunteer coordination. Membership ranged from roughly 15 to 50 students across three seasons.
- Secured a \$45,000 annual base budget from the school in the team's second and third years, an increase driven by competition results, supplemented by sponsorships, grants, individual donations, and a GoFundMe campaign.
- Received the second installment of the *FIRST*® New Team Grant and submitted grant applications to the Bayer Fund, REV Robotics, Intuitive, BAE Systems, and the YMCA Youth Empowerment Fund, among others.
- Developed the team's sponsorship program and tiered benefits package. Delivered an in-person presentation and robot demonstration to Swope Design Solutions, a primary sponsor, and maintained the relationship through routine updates and event invitations.
- Authored or co-authored the team's core business and operating documents: business plan, sponsorship program, team handbook, EDI plan, student roles and responsibilities, branding guide, presentation templates, technical and entrepreneurship binder templates, accounting and budgeting sheets, inventory and purchasing sheets, season and off-season schedules, and meeting agendas and minutes.
- Ran marketing and outreach: a social media presence across Chief Delphi, Instagram, TikTok, Threads, Facebook, and GitHub, schoolwide announcements reaching more than 1,100 students, and demonstrations at county fairs, parades, community presentations, and K-8 outreach events.
- Prepared the team's 2023 Entrepreneurship Award submission covering mission statement, organizational structure, SWOT analysis, marketing strategy and financials, and presented it in a judged interview at CalGames 2023.

TEACHING AND TUTORING EXPERIENCE

Archbishop Riordan High School

San Francisco, CA

Volunteer Tutor

January 2023 to May 2025

- Tutored high school mathematics and science, completed as National Honor Society service hours.

Healthy Cities Tutoring

Redwood City, CA

Volunteer Tutor

December 2022 to May 2025

- Tutored elementary and junior high school students in underserved communities.

TECHNICAL SKILLS

CAD & Mechanical Design: Onshape, Fusion 360, SolidWorks (in progress), part and assembly modeling, mechanism and drivetrain design, dimensioned engineering drawings, bills of materials (BOMs), tolerance and fit checks, design iteration, rapid prototyping

Manufacturing & Fabrication: CNC milling, 3D printing (FDM), laser cutting, drill press, band saw, manual hand and power tools, shop safety practices

Electrical & Hardware: Wiring harness fabrication, crimping and connectorization, through-hole assembly standards, 12V high-current power distribution, main breakers and fusing, motor controllers, CAN bus, PWM, encoders and limit switches, multimeter troubleshooting

Programming Languages: Java, JavaScript, Python, MATLAB, HTML and CSS (hands-on); TypeScript and SQL (working knowledge)

Robotics & Controls: WPILib, CTRE Phoenix 6, REVLib, PathPlanner, Choreo, AdvantageKit, PhotonVision, Limelight and MegaTag2, AprilTag localization, swerve drive kinematics, odometry and pose estimation, PID and closed-loop control, sensor fusion, autonomous path planning, physics simulation, VEX V5 and VEX IQ

Software & Tools: Node.js, React, React Native, Fastify, Express, EJS, SQLite, Firebase, WebSockets, REST APIs, Vite, Tailwind CSS, Playwright, unit testing, Git and GitHub, Gradle, Android Studio, Visual Studio Code, Google Workspace administration, technical documentation

Business & Operations: Fundraising and sponsorship development, grant writing, budgeting and accounting, business planning, SWOT and risk analysis, brand development, marketing and social media, event operations, student recruiting and volunteer coordination, board reporting, business and technical documentation

AI-Assisted Development: Claude Code in production software work. Writing the specification first, breaking work into reviewable milestones, running adversarial design review, and reviewing, testing, and verifying generated code by hand.

LEADERSHIP POSITIONS

Mentor, Pumpkin Bots / 8793, FIRST® Robotics Competition **June 2025 to Present**

Mentor, Mercy Mechs / 18233, FIRST® Tech Challenge **July 2026 to Present**

Mentor, White Hat Hackers / 11230, FIRST® Robotics Competition **August 2025 to April 2026**

- Mentoring multiple FIRST® Robotics Competition and Tech Challenge teams across mechanical, electrical, and software functions. In practice, that means reviewing student Java code, running build and off-season training, and providing design expertise.
- Built the shared tooling multiple teams can use, including a reusable WPILib robot template and a vendor library specification.

Student Advisor, Pumpkin Bots / 8793 **August 2024 to June 2025**

- Advised team leadership on technical direction and build-season planning.

Team Captain and Founding Member, Armor Robotics / 9143 **January 2022 to June 2025**

- Co-founded the team and led it as Team Captain through three competition seasons.
- Ran build-season planning, decided subsystem assignments, and set competition strategy across the mechanical, electrical, and programming subteams.

Competition Volunteer, FIRST® FRC, FTC, and FLL-C **February 2023 to Present**

Co-Vice President, READI Club, Archbishop Riordan High School **August 2023 to June 2025**

Vice President, Comic Book Club, Archbishop Riordan High School **August 2023 to June 2024**

Team Captain, U15, SF Elite Volleyball Club **August 2022 to January 2023**

Team Captain, U14, Red Rock Volleyball Club **August 2021 to January 2022**

AWARDS AND HONORS

Academic

Advanced Placement Scholar with Distinction, <i>College Board</i>	2024, 2025
National Merit Commended Student, <i>National Merit Scholarship Corporation</i>	2024
Magna Cum Laude, <i>Archbishop Riordan High School</i>	2025
Academic Award in AP Statistics, <i>Archbishop Riordan High School</i>	2025
President's Honor Roll, <i>Archbishop Riordan High School</i>	2023 to 2025
National Honor Society	2022 to 2025
California Scholarship Federation	2022 to 2025
St. Francis Scholar, <i>Archbishop Riordan High School</i>	2021 to 2025

Robotics

Dean's List Semi-Finalist, <i>FIRST® Robotics Competition</i>	2023, 2024
Gracious Professionalism, five recognitions, <i>FIRST® California</i>	2023, 2024

Athletics

Gold Medal, 16 USA, <i>NCVA Boys Far Western National Qualifier</i>	2023
Gold Medal, 15 USA, <i>Far Western No Dinx Boys Qualifier</i>	2023
Silver Medal, 15 USA, <i>USA Volleyball National Championship</i>	2023

Service

President's Volunteer Service Award, Gold, <i>AmeriCorps</i>	2023
--	------

ACTIVITIES

University and Professional Engineering

ASME at UCLA, <i>American Society of Mechanical Engineers</i>	2025 to Present
Westwood SolidWorks User Group, <i>Dassault Systèmes</i>	2025 to Present

FIRST® Robotics

Competition Volunteer, <i>FIRST® Robotics Competition</i>	2025 to Present
Pumpkin Bots / 8793, <i>FIRST® Robotics Competition</i>	2023 to Present
Armor Robotics / 9143, <i>FIRST® Robotics Competition</i>	2022 to 2025
LGBTQ+ of <i>FIRST®</i>	2023 to 2025
<i>FIRST®</i> For All Student Fellowship, Armor Robotics / 9143, <i>FIRST® California</i>	2023 to 2024
Competition Volunteer, <i>FIRST® LEGO® League Challenge and FIRST® Tech Challenge</i>	2023 to 2025

Athletics

Setter, U18, <i>Academy of Volleyball</i>	2024 to 2025
Setter, U15 and U16, <i>SF Elite Volleyball Club</i>	2022 to 2024
Setter, Boys Volleyball Club, <i>Archbishop Riordan High School</i>	2023
Setter, U14, <i>Red Rock Volleyball Club</i>	2021 to 2022
Varsity Tennis, <i>Archbishop Riordan High School</i>	2022

High School Clubs and Organizations

Business Club, <i>Archbishop Riordan High School</i>	2024 to 2025
Math Circle, <i>Archbishop Riordan High School</i>	2024 to 2025
READI Club, <i>Archbishop Riordan High School</i>	2021 to 2022, 2023 to 2025
Junior Prom Planning Committee, <i>Archbishop Riordan High School</i>	2024
D&D Club, <i>Archbishop Riordan High School</i>	2023 to 2024
Comic Book Club, <i>Archbishop Riordan High School</i>	2023 to 2024
Boys Volleyball Club, <i>Archbishop Riordan High School</i>	2023
Robotics Club, <i>Archbishop Riordan High School</i>	2021 to 2022
Voltaire Scholars Society, <i>Archbishop Riordan High School</i>	2021 to 2022

CERTIFICATIONS

Certified Onshape Associate, <i>Onshape / PTC</i>	In Progress
Advanced Open Water Diver, <i>Professional Association of Diving Instructors, PADI</i>	2023
Enriched Air Diver, <i>Professional Association of Diving Instructors, PADI</i>	2023
Junior Open Water Diver, <i>Professional Association of Diving Instructors, PADI</i>	2019
First Aid/CPR/AED, <i>American Red Cross</i>	2017

TRAINING AND PROFESSIONAL DEVELOPMENT

WRRF Conference 2022: Crossroads; <i>Western Region Robotics Forum</i>	November 2022
California Harassment Prevention, Anti-Discrimination, and Youth Safety Training; <i>iD Tech</i>	June 2026

LANGUAGES

English	Native
American Sign Language	Conversational

PRESENTATIONS

Dean et al. "Armor Robotics FRC Team 9143." Presentation, YMCA Youth Empowerment Fund, October 2023.
Dean et al. "Armor Robotics Entrepreneurship." Presentation, CalGames, October 2023.
Dean et al. "Armor Robotics Team 9143." Presentation, Swope Design Solutions, September 2023.
Dean, E. "Basic FRC Electrical." Training session, Pirate Robolution / FRC 5430, August 2026.

PROJECTS

Software projects were built with AI assistance (Claude Code) from a specification written first. Architecture decisions, code review, and testing were done by hand. Robotics projects are released open source; iD Tech Watch is published publicly but retains full copyright.

Mechanical Design and Technical Documentation

SUMMIT PUSH, CADathon 2026 off-season game package.

An off-season robotics game designed end-to-end. Two alliances of three robots climb opposite sides of a peak, carrying supplies to a 90in spire that lights up tier by tier as camps are established. A randomized forecast at the start of the match forces teams to write branching autonomous routines, and the last 30 seconds are a climb on a truss leaning at 15 degrees. The package contains a design-research foundation, a locked design specification, a full game manual that went through a red team pass, per-element field CAD with bills of materials in both an official version and a low-cost plywood version, dimensioned SVG drawings of the field and game pieces, and a 26-tag AprilTag (36h11) layout with mounting and simulation guidance for PhotonVision and Limelight.

WRRF Google Workspace architecture and migration package. Python, XLSX, and HTML generation.

An architecture document, migration runbook, interactive drive wireframe, and ten-tab build tracker covering organizational units, groups, ten shared drives, a permissions matrix, all 182 folders, the user roster, file inventory, cutover checklist, and retention schedule. The wireframe and workbook are generated from a shared folder-tree definition rather than hand-maintained, so they cannot drift apart.

WRRF operations documentation set.

A nine-document governance package covering principles and decisions, workspace architecture, drive mapping, the migration runbook, the training system, youth protection, event operations, records and retention, and a security baseline.

FRC electrical training curriculum.

Basic and advanced sessions written for student robotics teams, covering electricity, Ohm's law and circuits, component identification, power and signal paths, assembly standards, and troubleshooting.

Robotics Software

FRC Robot Template, WPILib 2026. Java.

A state-based Java robot template for teams starting a season from scratch, with full AdvantageKit deterministic replay. It brings together swerve drive, PathPlanner and Choreo autonomous with on-the-fly pathfinding, the Elastic dashboard, AdvantageKit logging into AdvantageScope, Glass, physics simulation, and unit tests. It ships fill-in-the-blank mechanisms for an elevator, arm, wrist, turret, shooter, intake, indexer, end effector, climber, and CANDLE LEDs, with a vision backend that can switch between Limelight and PhotonVision.

Team 9143 competition robot code, A and B robots. Java, CTRE Phoenix 6, REVLib.

Two robot codebases kept current with each year's WPILib and vendor libraries. The A robot runs a Phoenix 6 swerve drivetrain on a 30in square frame with mixed SDS MK4i and MK4n modules, Kraken X60 drive and steer motors, CANcoders, and a Pigeon 2. On top of that sits a dual-NEO elevator with closed-loop height control in inches, a pivoting arm and intake that finds its angle off an absolute encoder and detects game pieces with a CANrange, and three Limelights fusing MegaTag2 pose estimates into odometry. The B robot shares the drivetrain and adds a KitBot roller and a pivoting ground intake that holds position under closed-loop control.

PumpkinLib. Java.

A vendor library for *FIRST*® Robotics Competition teams. It is currently a design specification of over 20,000 lines across design, decisions, and roadmap documents, with no implementation written yet. The roadmap states a realistic solo developer delivery estimate, but nothing will be announced until v0.1 is tagged.

Software and Web Applications

Internship Applier. TypeScript, React, Fastify, SQLite, Drizzle ORM, Playwright, Zod.

A local-first desktop tool that reads a resume, identifies internships the user is eligible for, and, after per-posting approval, drafts application answers in the user's own writing voice and pre-fills the form for review. Built across eight milestones covering resume ingestion, discovery, matching, a review queue, the writing engine, form filling, a tracker, and packaging, each with its own test suite. It includes a verification gate that refuses to generate any sentence it cannot trace back to a stored fact in the profile.

CalGames 2026 Content Desk. TypeScript, WebSockets.

A broadcast and analysis setup for a 40-team robotics event, built to make it feel like a televised sport. Instant replay, an analyst view for drawing on the field, alliance previews before each match, live scoring graphics, and trivia the crowd plays from their phones. Structured so another event can fork it: the colors are one token file, the event is one config file, and swapping field systems means writing one adapter.

iD Tech Watch. Node.js, WebSockets.

A classroom management system for iD Tech Camp. Instructors can view the open windows on every laptop in their class, close unauthorized applications, temporarily block games and gaming sites, pause screens, rename machines to the current week's students, and schedule daily events. Administrators manage an entire organization from a web panel, organized by location, building, class, and computer. Rebuilt in Node after contributing changes to a peer's earlier Flask version.

Western Region Robotics Forum website. Node.js, Express, EJS, SQLite.

A web application for the organization. It serves the public site and adds working contact forms, site-wide search, and a password-protected staff area where staff can edit page content, manage events and people, and run a document library with upload, download, replace, and delete, each file marked public or staff-only. Built on Node's built-in SQLite, so there is no build step and no native dependencies to compile.

Groundwork Robotics website and content management system. Node.js, Express, EJS, SQLite.

Public site and staff CMS for a California nonprofit that trains and supports the students and adults behind competitive robotics, accompanied by a brand package and a document generation toolchain.

FRC Tools. TypeScript monorepo.

A product strategy project examining what competition software the FRC community lacks. The conclusion was that the gap is data transport, schema, and archival rather than scouting applications themselves. An adversarial review pass cut the original scope roughly in half, leaving a three-package specification intended for implementation: a Bluetooth Low Energy courier, a bridge service, and match analytics.