

ENGINEERING DESIGN + PROTOTYPING

MA INDUSTRIAL SYSTEMS

Mando + Mike Dominguez

Mechanical systems / CAD / composites / electromechanical integration

FROM GEOMETRY TO HARDWARE.

A project portfolio built around real racecar systems, CAD development, fabrication, fit-up, and prototype iteration.

SELECTED WORK • 2026

OVERVIEW

Built for real hardware, not just screenshots.

The work in this portfolio spans concept geometry, CAD assemblies, hands-on vehicle integration, composites, and mechanical/electrical packaging. The common thread: understand the system, make it fit, build it, and iterate.

ADDITIONAL CAD + TECHNICAL DRAWINGS

SolidWorks + Autodesk CAD experience | Original dimensioned drawing sample on page 9

01

MECHANICAL CAD

Parts, assemblies, packaging, interfaces, and design iteration.

02

VEHICLE SYSTEMS

Suspension geometry, chassis packaging, component fitment, and hardware integration.

03

COMPOSITES + AERO

Wing CAD, composite process experience, trim/fit, and racecar integration.

04

ELECTROMECHANICAL

PCB/connector packaging and mechanical interfaces around electrical hardware.

05

PROTOTYPING

Hands-on assembly, measurement, fit checks, troubleshooting, and rapid iteration.

06

DELIVERABLES

SolidWorks, STEP/STL exports, fabrication-ready concepts, and clear design visuals.

Mando

Technical lead • design + build execution

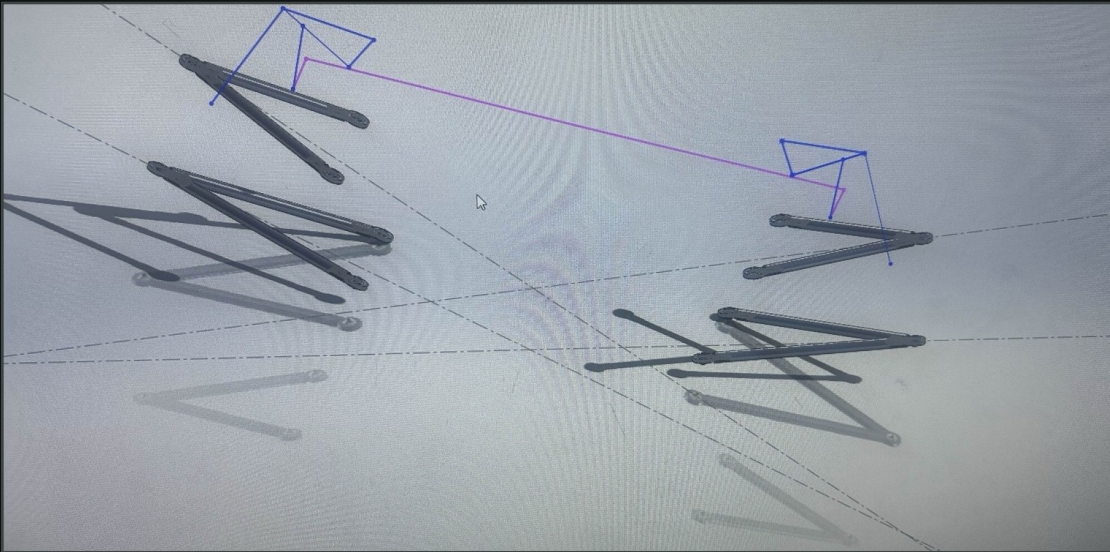
Mike Dominguez

Project partner • client-facing collaboration

Featured technical work shown here was led and executed by Mando.

Suspension geometry + hardware integration

Working from layout to physical hardware means every decision has consequences: hard points, control-arm packaging, damper placement, steering clearance, adjustability, and access all have to coexist.



SYSTEM-LEVEL EXPERIENCE

Control-arm layout and suspension packaging were developed in CAD, then checked against the physical car. The work shown includes uprights, damper/rocker hardware, links, and real assembly constraints rather than isolated textbook geometry.

Hard points

Packaging

Fitment

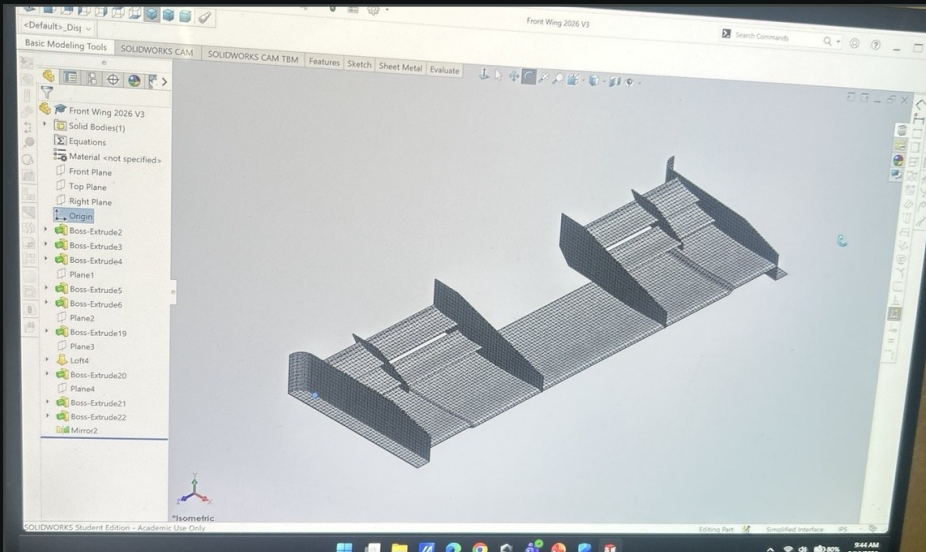
Adjustability

Assembly

Troubleshooting

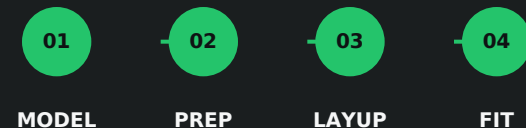
CAD intent translated into physical parts

Aerodynamic hardware only matters if it can be manufactured, mounted, serviced, and survive the car. This work combines SolidWorks modeling with hands-on composite fabrication and final vehicle fit.



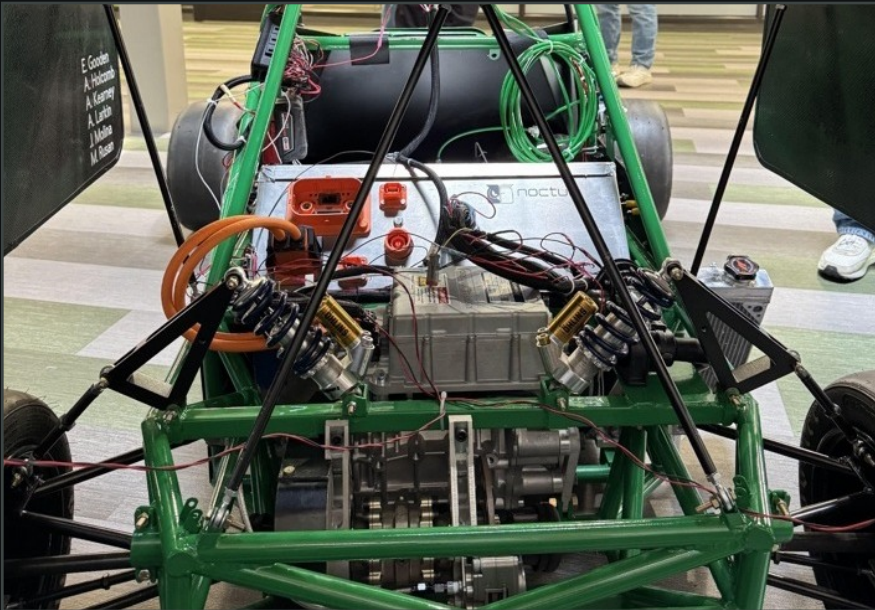
DESIGN -> PROCESS -> FIT

Experience spans front/rear wing CAD, composite prep and layup workflow, trim/fit, and integration on the finished Formula SAE car. The goal is not a pretty model - it is a part that can actually be built and installed.



Packaging inside a machine where everything competes for space

Racecar integration is a constraint problem: drivetrain, suspension, structure, electrical routing, cooling, service access, and aero all want the same volume. Hands-on work builds the judgment CAD alone cannot.



FITMENT

Check real clearances and hardware access.

ASSEMBLY

Install, remove, align, and reassemble components.

ITERATION

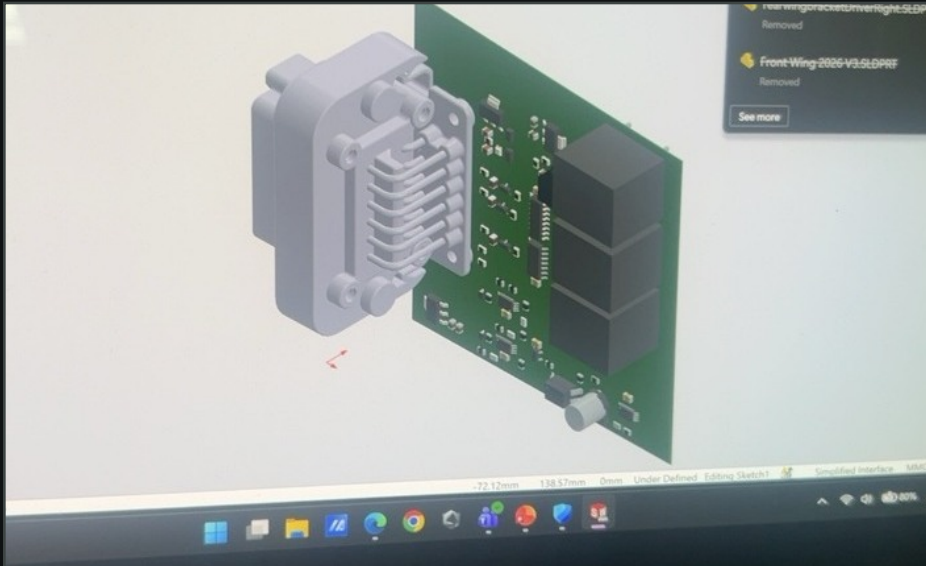
Find interference early and revise the design.

SYSTEM THINKING

Design around neighboring subsystems, not in isolation.

Mechanical design across interfaces

Good hardware design rarely stays inside one discipline. These examples show CAD work around a PCB/connector interface plus steering hardware and geometry - exactly the kind of cross-domain packaging that makes prototypes feel intentional.



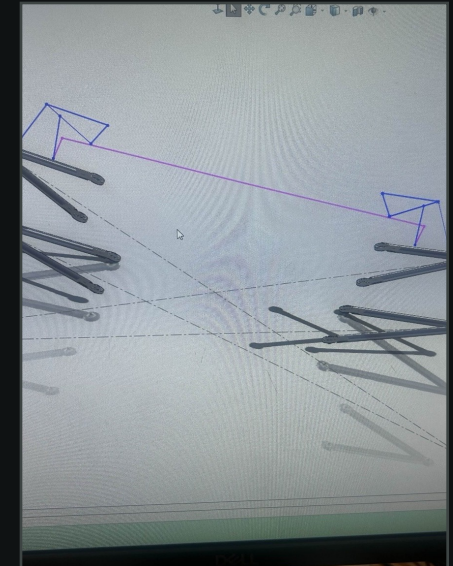
PCB + CONNECTOR PACKAGING

Mechanical envelope, connector interface, component clearance, and assembly context around an electrical board.



STEERING HARDWARE

Hands-on familiarity with compact steering components, mounting, and vehicle-side packaging constraints.

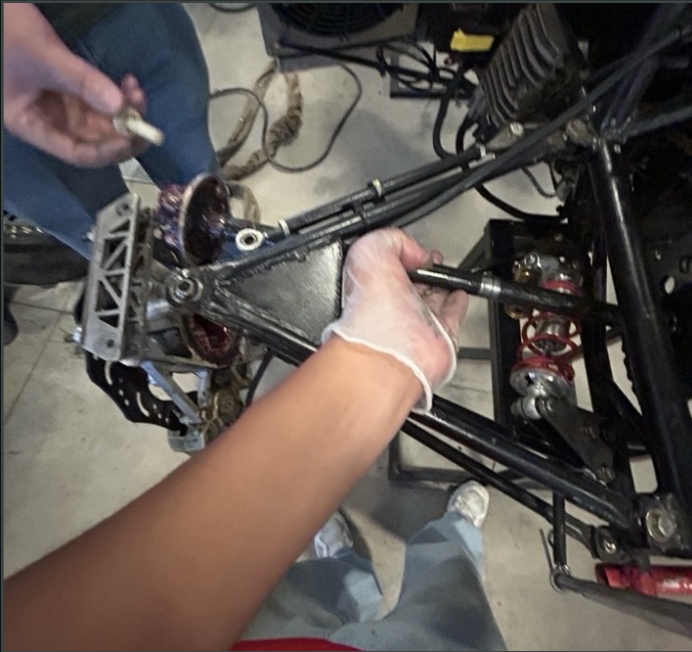


ASSEMBLY-LEVEL CAD

Geometry and neighboring components considered together instead of designing a part in a vacuum.

The loop: measure -> model -> build -> fit -> revise

Hands-on work closes the gap between what should fit and what actually fits. That feedback loop is where better engineering decisions come from.



01
MEASURE

02
MODEL

03
BUILD

04
CHECK

05
REVISE

AVAILABLE FOR SMALL DESIGN JOBS

Need a part designed, packaged, or prototyped?

Best fit: small shops, student teams, builders, and early-stage hardware projects that need practical CAD plus someone who understands how parts get assembled in the real world.

CAD PARTS + ASSEMBLIES

SolidWorks modeling, clean assemblies, packaging studies, STEP/STL exports.

BRACKETS + MOUNTS

One-off hardware, tabs, mounts, fixtures, and packaging-driven components.

REVERSE ENGINEERING

Rebuild simple components from measurements, references, and existing hardware.

RAPID PROTOTYPES

3D-print-ready concepts, fit-check parts, and quick design iterations.

VEHICLE PACKAGING

Suspension/steering packaging concepts and racecar hardware integration.

ELECTROMECHANICAL

Connector, PCB, enclosure, and mechanical-interface packaging.

Mando + Mike Dominguez

Student-led engineering design + prototyping

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LET'S BUILD SOMETHING USEFUL.

Share the scope, dimensions, constraints, and desired deliverables.

Adjustable Sensor Bracket | Prepared by Armando Avila Jr. | September 2026

Orthographic + isometric views / Hole and slot dimensions / Material and general tolerance notes

