HUMAN POWERED VEHICLE COMPETITION

Department of Mechanical and Aerospace Engineering at the University of California, Irvine

MISSION:

Design, fabricate and assemble an electrically-assisted, recumbent trike with off the shelf parts that is compact, ergonomic, adjustable, strong, and durable to compete in the National ASME competition.

HPVC TEAM:

Advisor
Professor David Copp

Project Manager
Wilson Huang

Statics Lead
Ocean Mou

MAE 93 Team
Rogel Aguilar, Neal Purohit, Wilson Huang, Ocean Mou, Matthew Quach, Victoria Liu, Ethan Servin, Josue Guerrero, Athena Wong, Luis Sandoval Huerta, Isaac An, Daniel Parra, Zubair Notta, Meera Sambhwani

Chief Engineer
Neal Purohit

Dynamics Lead
Jeffery Lasher

Electrical Lead
Jeffery Lasher

KEY FEATURES

- Material: 4130 Chromoly Steel Tubing | RPS 1.25"-0.0625" | Bottom Bracket 1.5"-0.0625" |
- The rollover protection system can withstand a side load of 1330 N and a top load of 2670 N (see "Finite Element Analysis").
- The top speed of our bike is 36.55 MPH @ 100 RPM, and the maximum braking force from 25 KPH is 849 N and the braking distance 3.02 m
- 48V Lithium battery, emergency stop, electric motor to assist pedaling.

BUDGET

Dynamics	Electrical	Statics
Drive Train | $369.98	Battery | $170	Tubing | $313.51
Steering | $120.60	Motor | $450	Harness | $67
Braking | $164.76	E-Stop | $12	Mirrors | $16
	E-Box & Contents | $174	

TOTAL COST: $1857.85

SPECIAL THANKS

Professor David Copp, we couldn't have done this without your guidance and support.
Tyler Schuldt, Jake Chutney, and Patrick Jerome Smyth for invaluable advice as well as making manufacturing on-campus possible.
President Kaydi Nomura and Vice President Kaitlyn Nguyen of ASME@UCI for supporting the team every step of the way.

LATE AUGUST eHPVC 2025 Rules Released

FALL QT. Design Definition

WINTER QT. Manufacturing & Testing

EARLY APRIL West Coast Competition DCRC

DYNAMICS SUBTEAM

Objective: Implement efficient drivetrain with robust braking and steering systems.

Drive Train: 10-speed cassette with a 500W electric, mid-drive motor

Braking System: Two front hydraulic brake calipers with 160mm rotors, rear v-brakes

Steering: 4-bar direct steering linkage, Rollover threshold of 0.75 G's, wheelbase length of 45", track width of 33"

STATICS SUBTEAM

Objective: Keep the rider safe and comfortable.

Rollover Protection Bar: Protects passenger during loss of control

Carbon Fiber seat: Set at 15 degrees from the horizontal for maximum human power and is placed on an adjustable seat mount.

ELECTRICAL SUBTEAM

Objective: Safely provide power and data

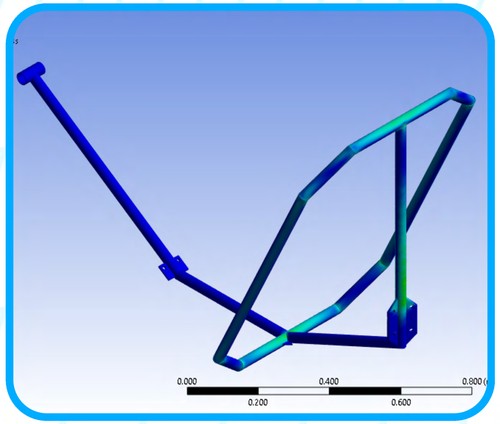
Electrical Box: Polycarbonate weather-proof enclosure with a polyurethane gasket

Emergency Stop: Button to isolate the battery and motor in case of an emergency

Arduino: Microcontroller used to process IMU positioning data and display onto LCD screen

STEERING MECHANISM

FINITE ELEMENT ANALYSIS



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