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Background

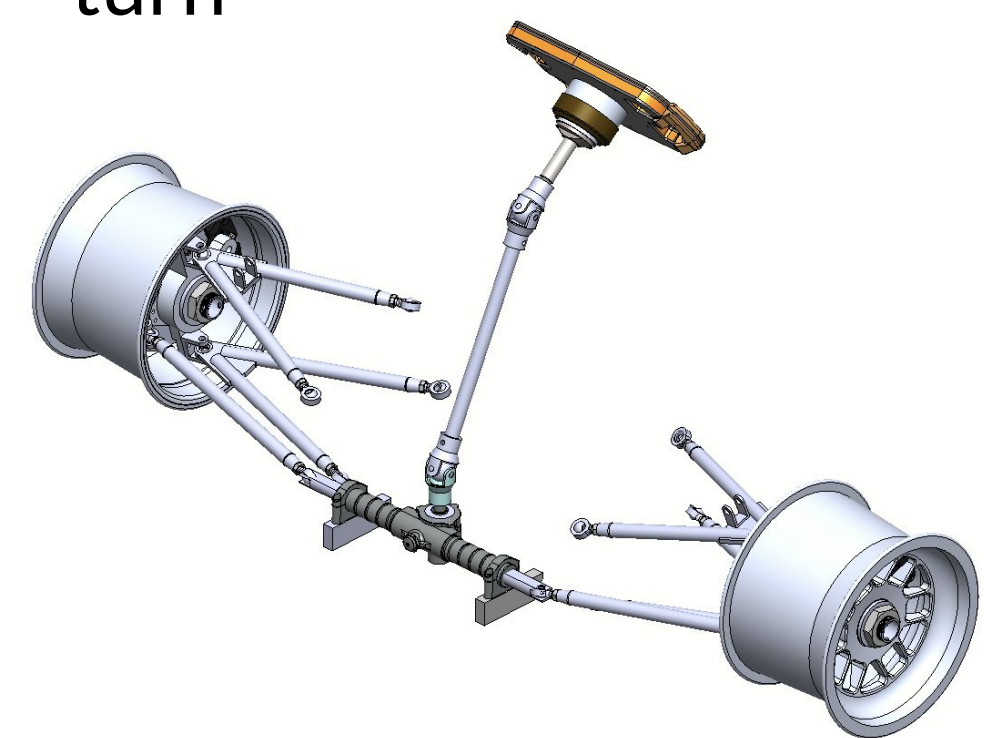
GR24 is divided into multiple specialized sub teams. This includes suspension, powertrain which encompasses the accumulator and drivetrain, aerodynamics, and controls. Within each subteam, subassemblies are formed, which serve to collectively contribute to the cars construction and performance.

Suspension

Suspension Design:

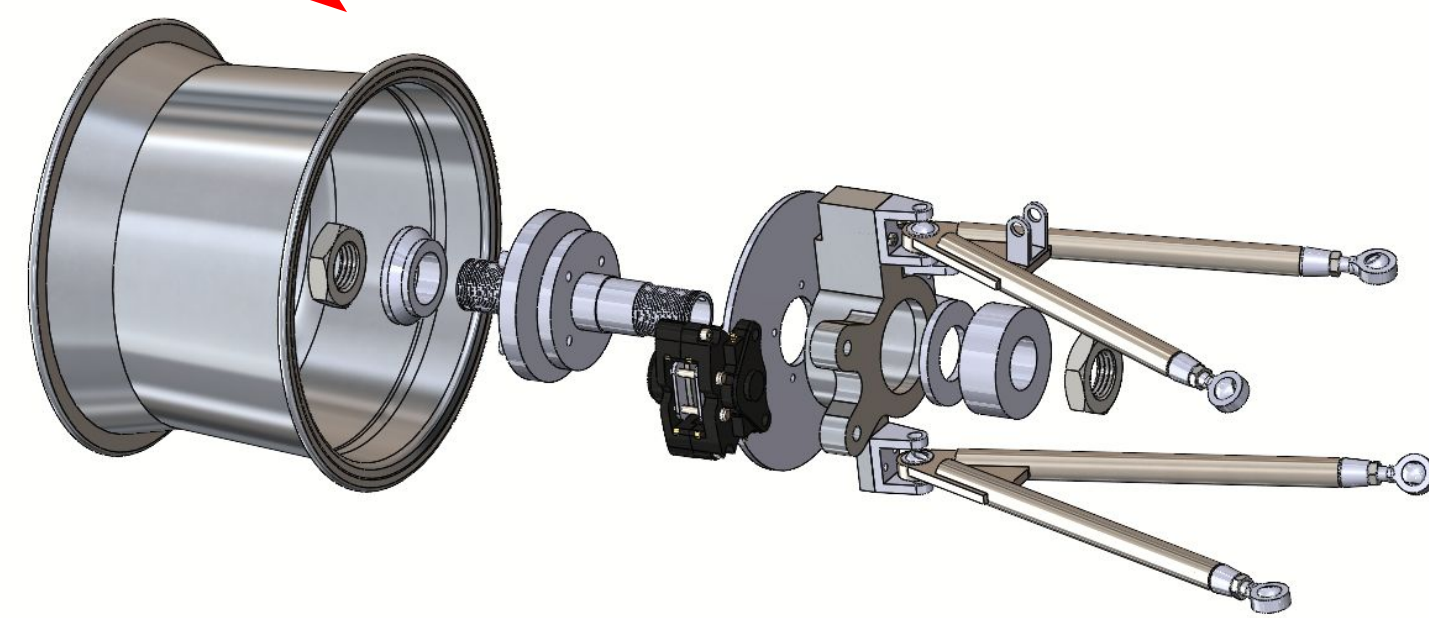
- Actuate a minimum of 50mm
- Withstand nominal 1.3g braking loads
- Aim for maximum acceleration of 1.3 g in a 5 m turn

	Front	Rear
Motion Ratio	1.1	1.3
Rotor Size	7.71 in	7.4 in
Steering Ratio	4.42:1	



Steering Rack

- Kaz Steering Rack
- Steering Effort: 0.74 lb ft
- Turning radius: 13 ft

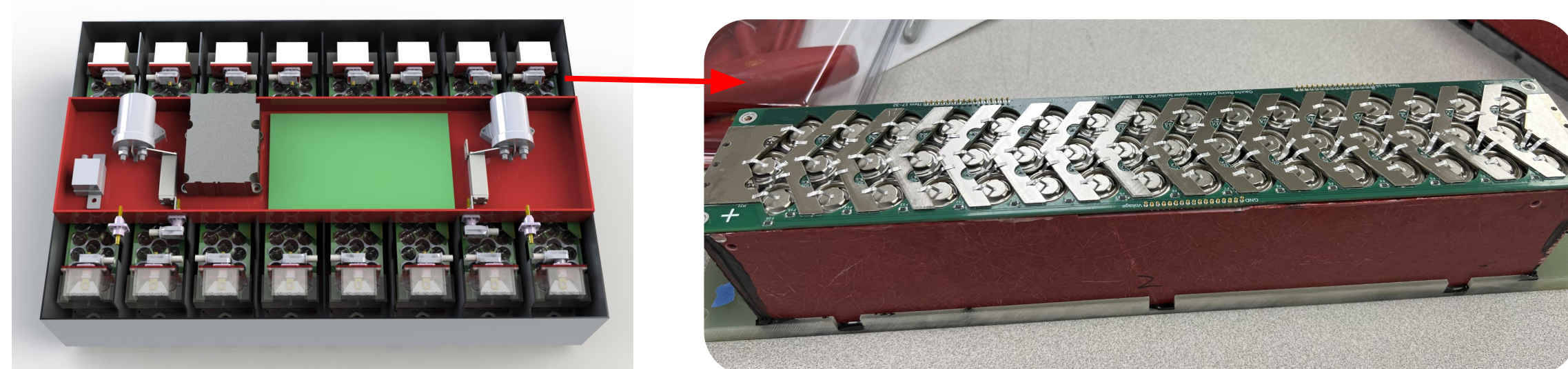


Wheel Assembly

- Attaches tire rim to suspension A-arms
- Mounts brake rotor, bearing, and sensors

Accumulator

Battery Segment

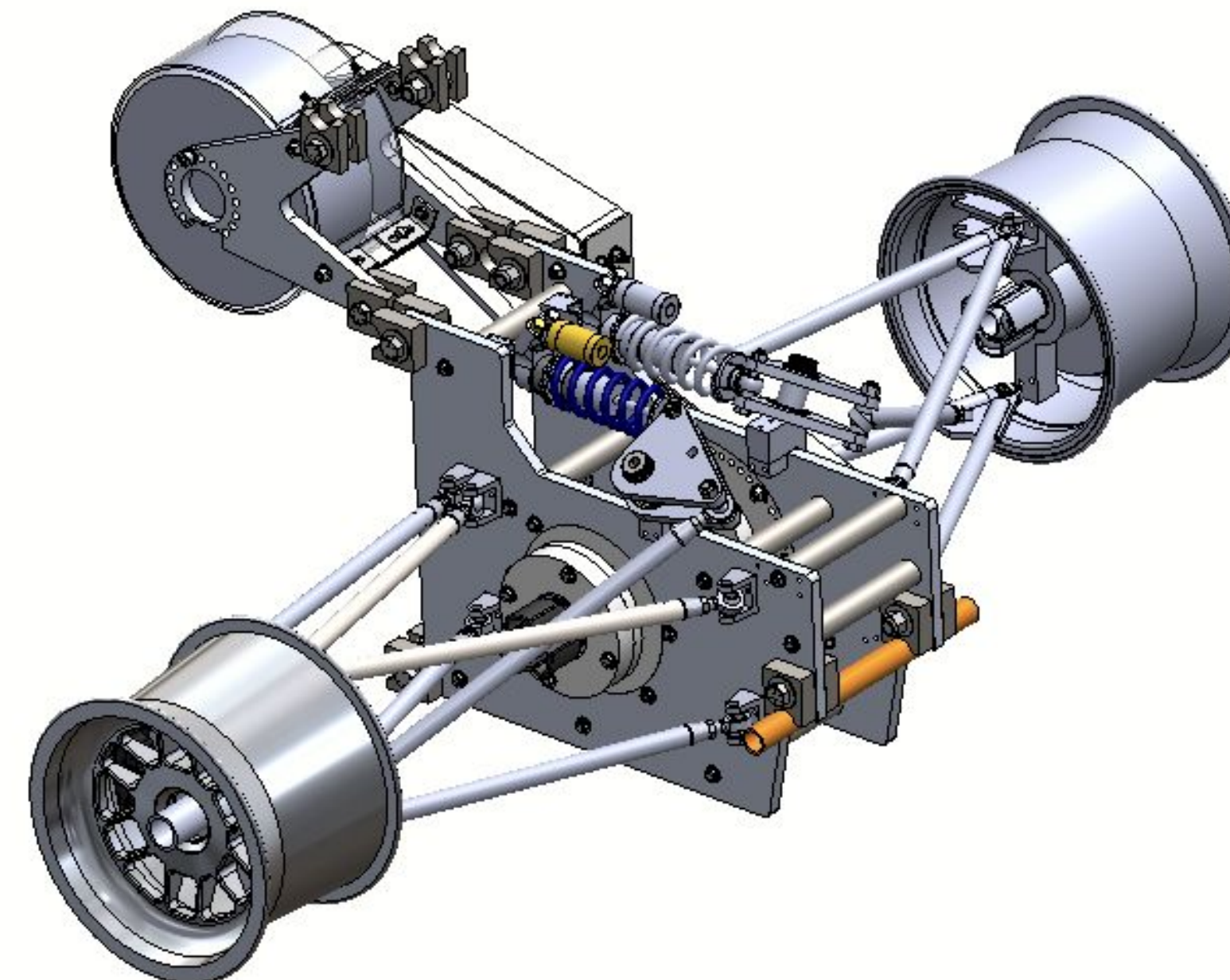


- 537 V segmented battery pack for 85.8 HP
- 2170 battery cells
- Battery management systems (BMS) and accumulator control units (ACU) mounted on top for sensors, battery, and control communication
- Aluminum mounts designed for 40 g's

GR24



Drivetrain

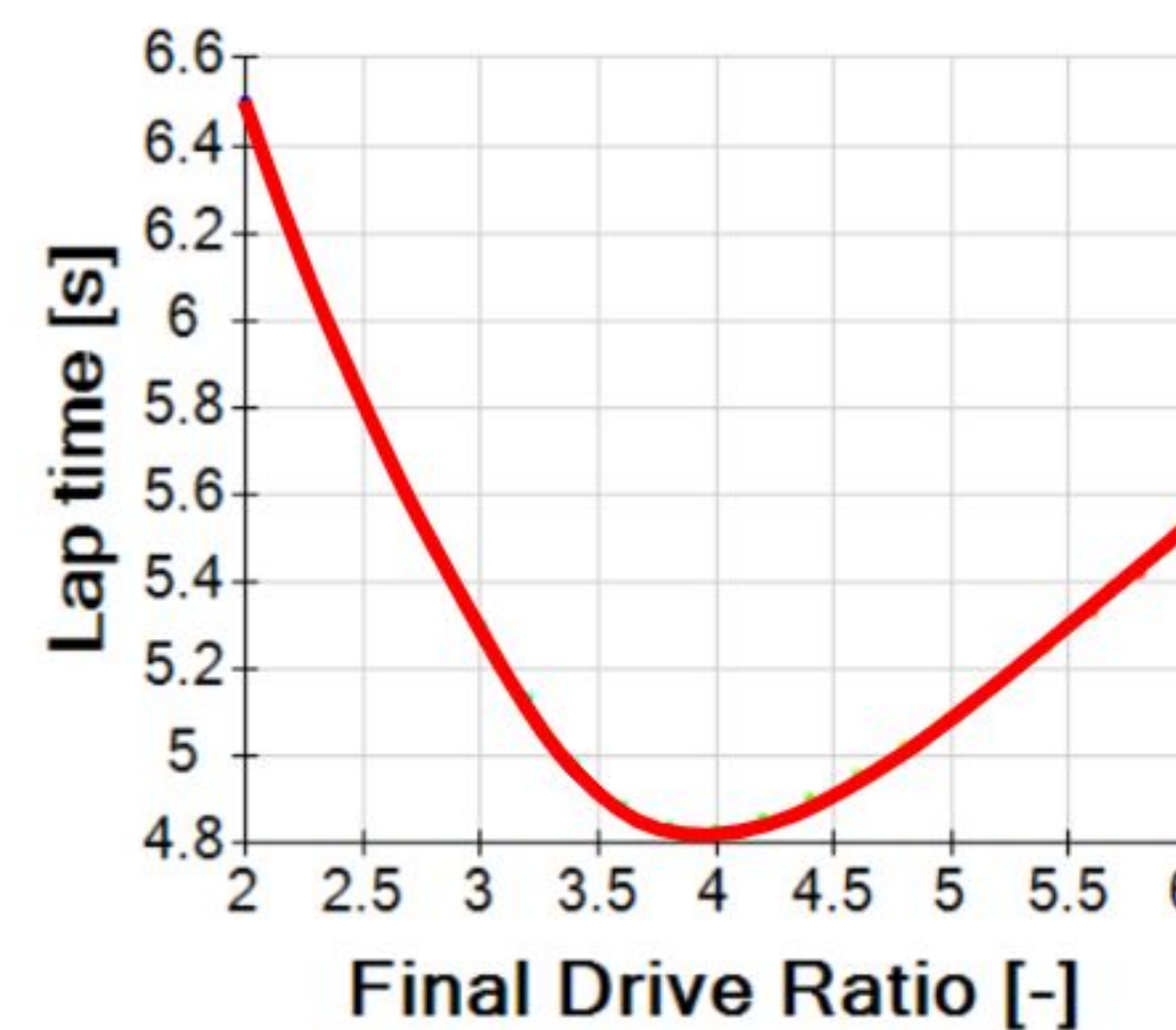


Rear Manifold

- Mounts rear suspension, differential, chain drive, and rear wing mounts for ease of access to accumulator
- 0.5" 7075-T6 Manifold Mounting Plate
- Weight: 101 lbs

Drivetrain Design:

- Eccentric Tensioner with 428 Chain
- Max Deflection 0.008"
- A36 Steel Cross Bracing
- Limited Slip Differential
- Gear Ratio: 3.57 optimized for acceleration event, which measures lap time on 75 m straight.



Aerodynamics

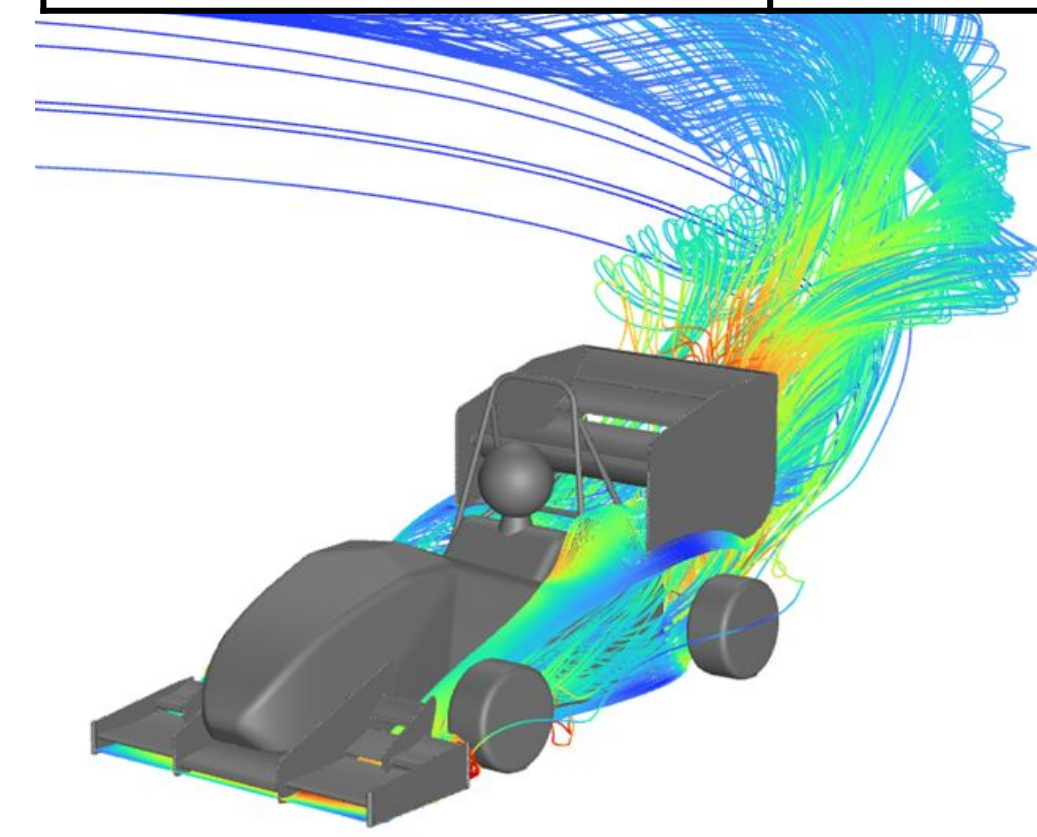
Subsystem Goals:

- Improve lap time performance through downforce production
- Reduce rear brake lock up through rearward downforce bias
- Maximize air flow to front brake rotors and radiator

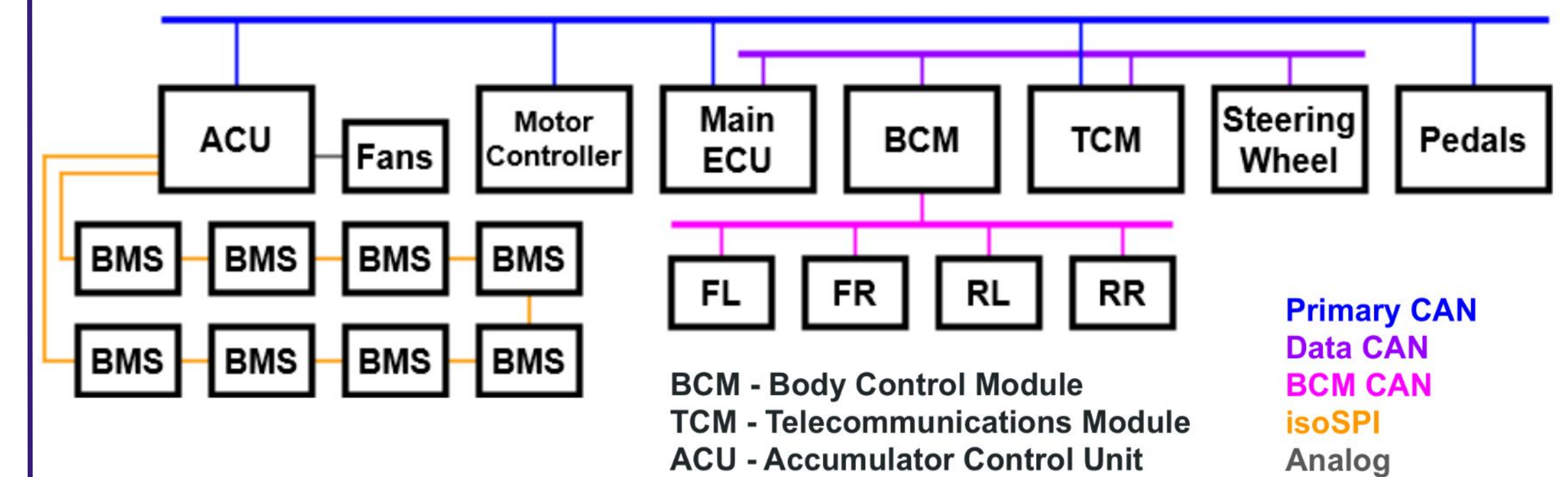
Simulations

- ANSYS 2D and 3D CFD simulations with 20.4 million cells
- Laptime simulations to characterize downforce performance relative to track geometry

Specs	Aero
Cl*A (m^2)	1.91
Cd*A (m^2)	1.35
Efficiency	1.42
Aero Balance	40/60
Weight	37 lbs



Controls



Architecture

- In-house Teensy 4.1-based main ECU (Electronics Control Unit) performing torque control, pedal plausibility checks, and shutdown circuit latching
- Telecommunications Module transmits vehicle sensor data via LTE to the cloud, where it is processed and scaled for real-time telemetry and anomaly detection in the SingleStore database



Steering Wheel

- Custom steering wheel with driver assists such as traction control and a LCD screen displaying vehicle data, current drive mode, and telemetry

Sponsors:



Acknowledgements:

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