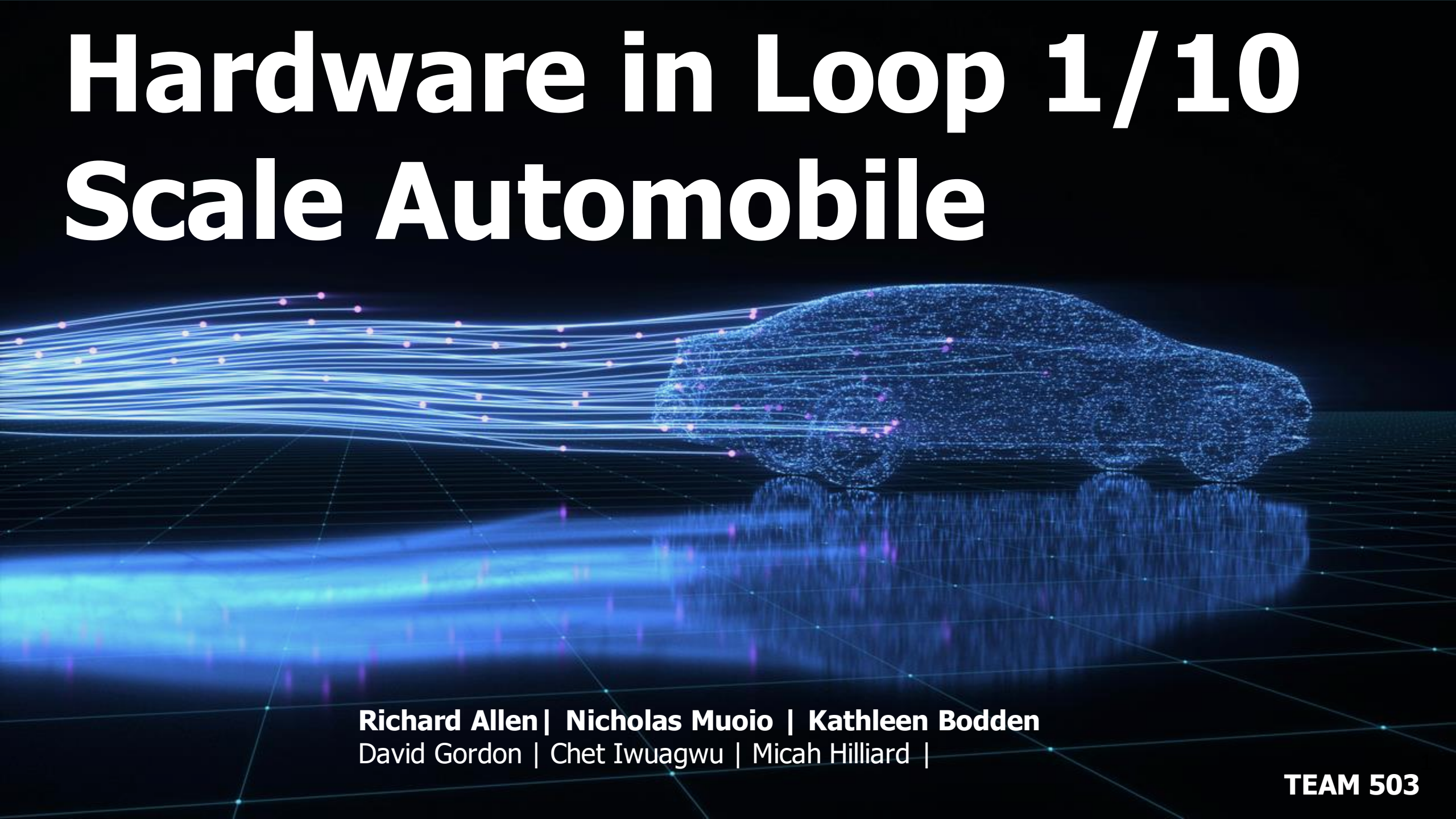
Hardware in Loop 1/10 Scale Automobile



Richard Allen | Nicholas Muoio | Kathleen Bodden
David Gordon | Chet Iwuagwu | Micah Hilliard |

TEAM 503

Meet Team 504

Richard Allen

Design Engineer

Micah Hilliard

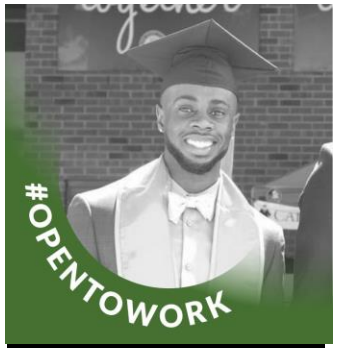
Structural Engineer

Nicholas Muoio

Controls Engineer

David Gordon

Hardware Engineer



Chet Iwuagwu

Software Engineer

Kathleen Bodden

Research/Test Engineer

Project Objective

The objective of this project is to autonomously minimize inertial forces during propulsion and integrate with a concealed tracking device.

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Stakeholders

Central Intelligence Agency

FAMU-FSU College of Engineering

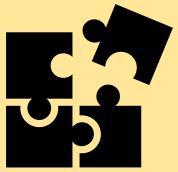
Stakeholders

Shayne McConomy
FAMU-FSU College of Engineering

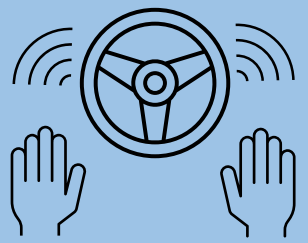
Camilo Ordoñez
FAMU-FSU College of Engineering

Christian Hubicki
FAMU-FSU College of Engineering

Key Goals



Integrated with Team 504

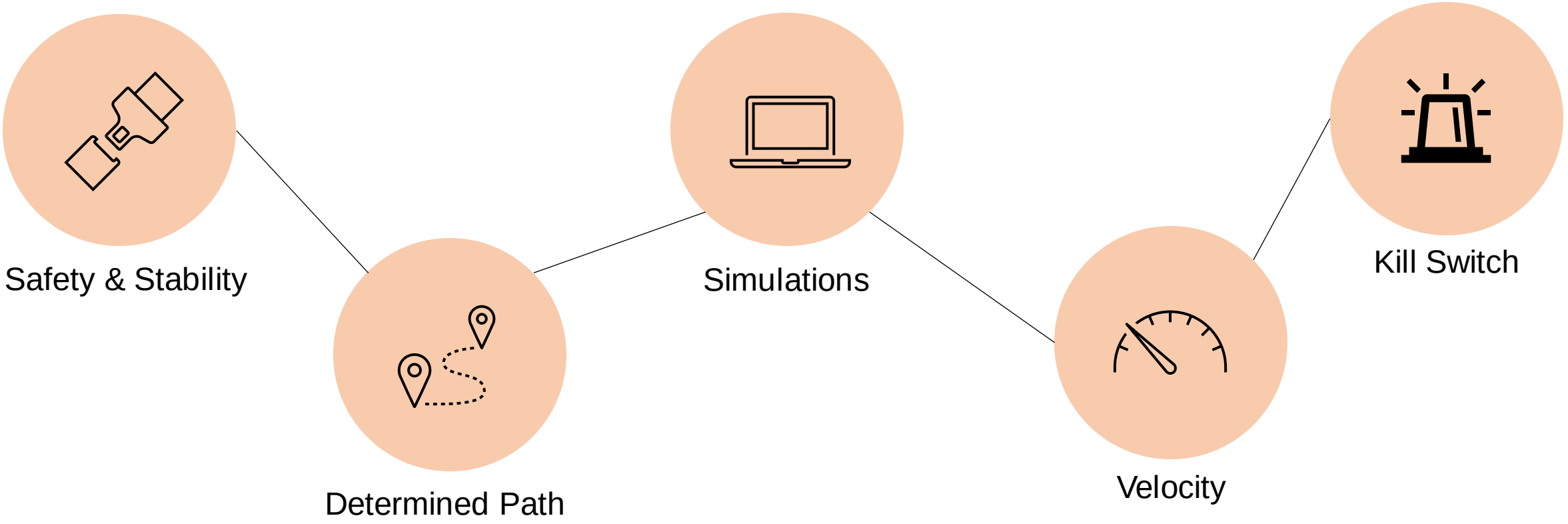


Autonomous

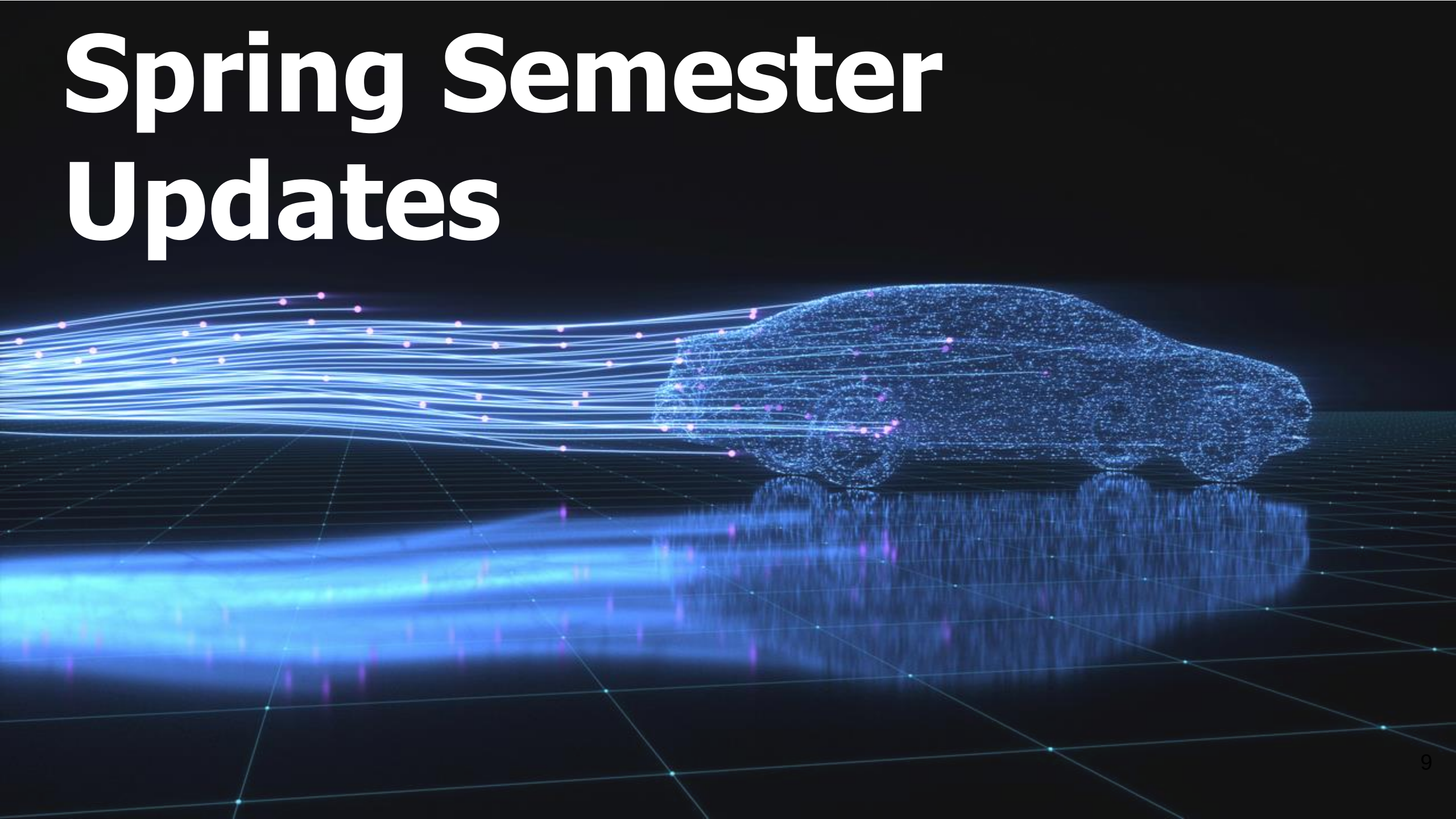
Maintain velocity

Minimize inertial losses

Customer Needs



Spring Semester Updates



System Breakdown

Computing & Path Planning

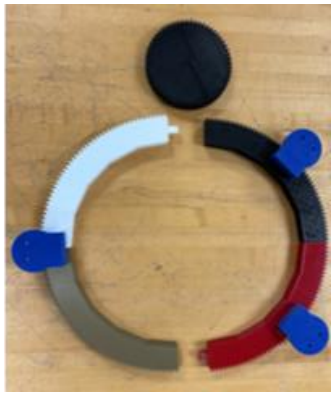
Object Detection

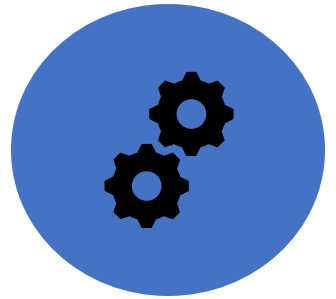
Steering Wheel Actuator

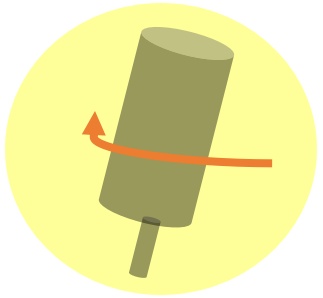
Motor Actuation and Control

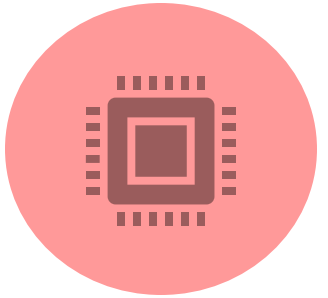
Steering Actuation

Initial Design







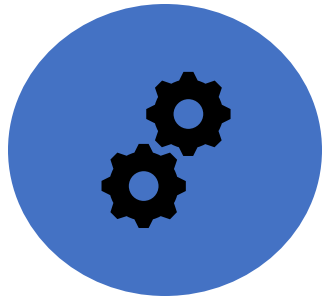


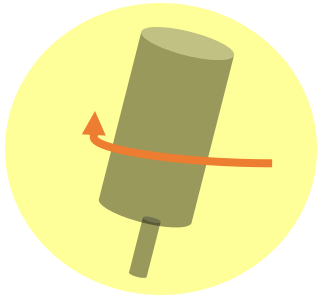
Steering Actuation

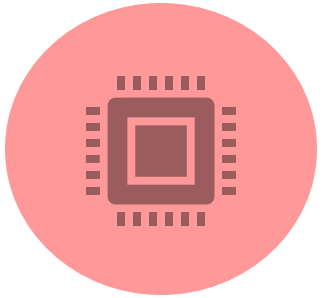
Initial Design

PROS → Precision

CONS → Machine Guarding

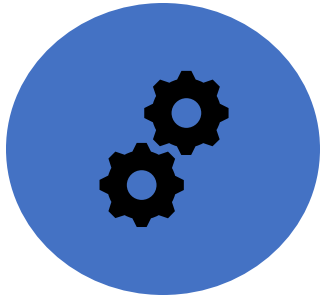


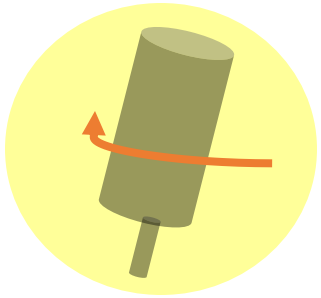


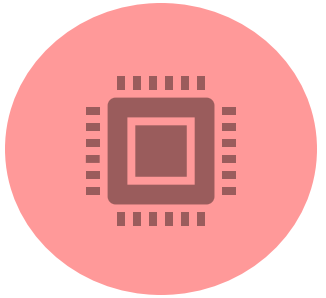


Steering Actuation

Current Steering





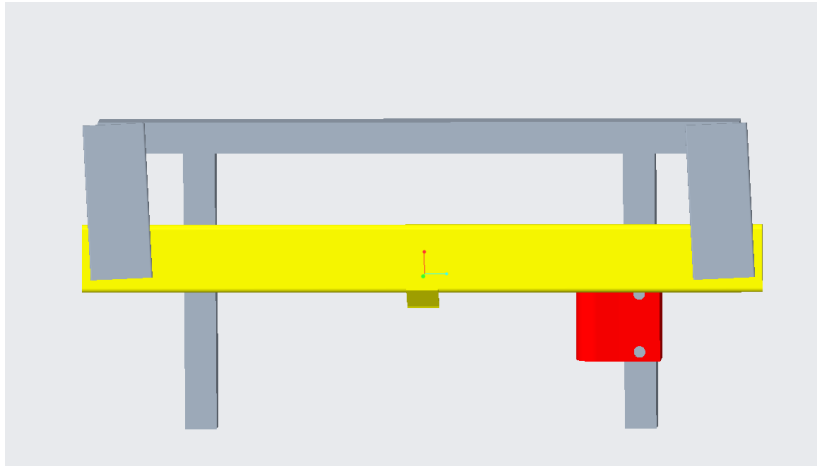


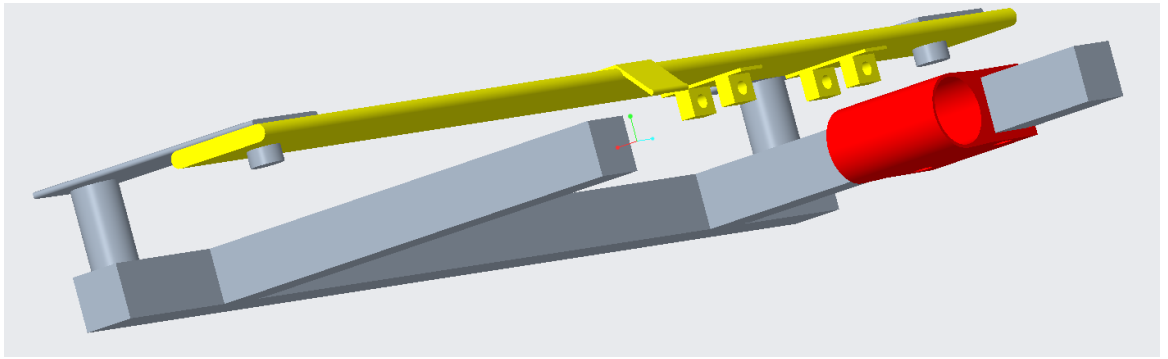
Steering Actuation

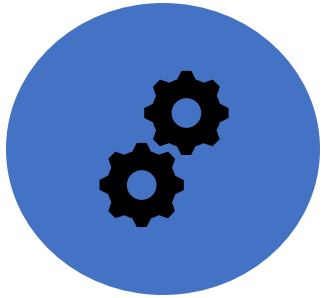
New Design

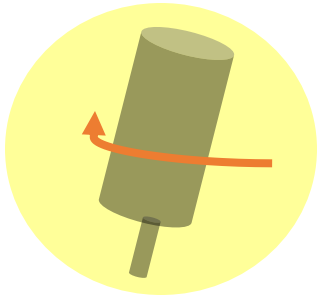
Rack and Pinion

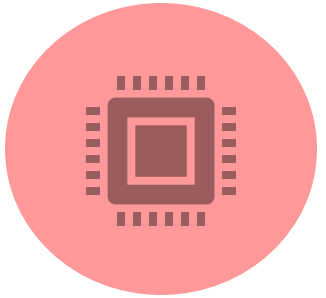
Motor enclosed in red casing
Rack mounted to steering frame in yellow











Steering Actuation

New Design

PROS

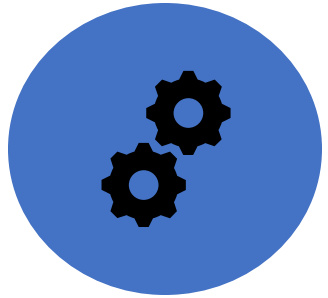
Safety

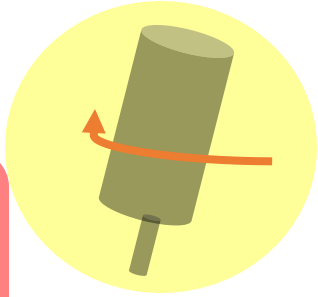
Aesthetics

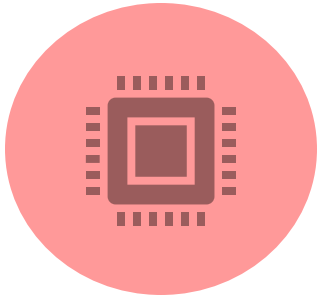
CONS

Space Restriction

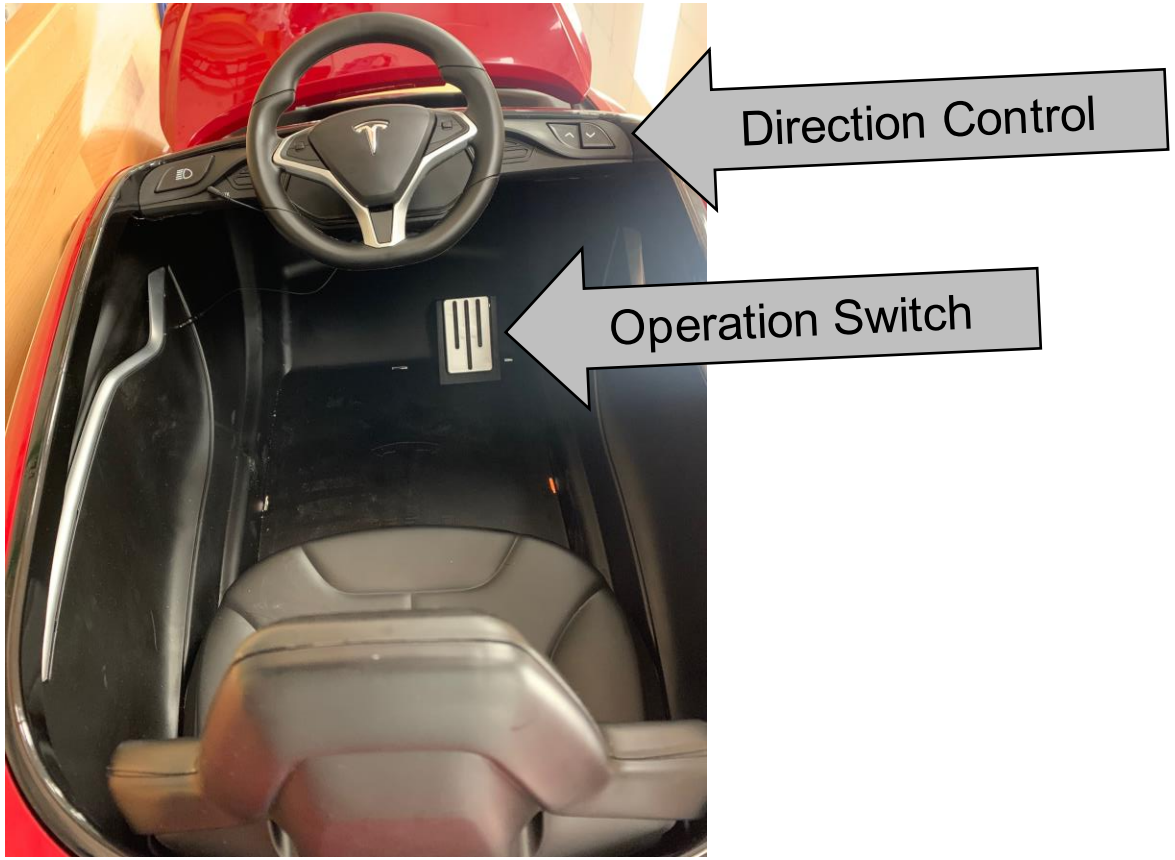
Gear Slippage

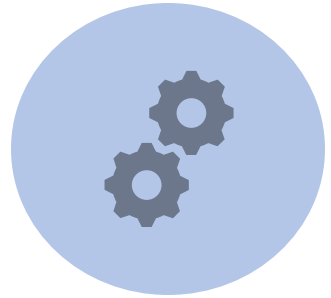


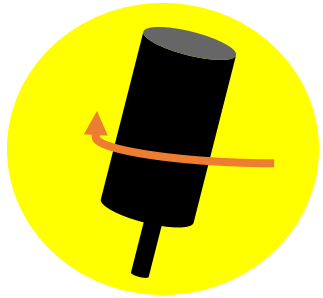


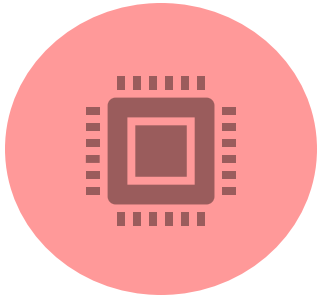


Motor Actuation



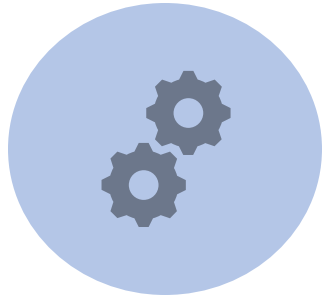


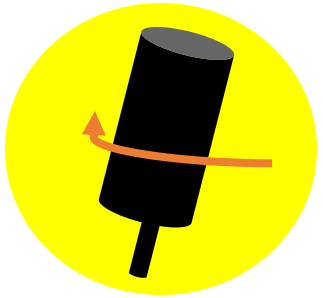


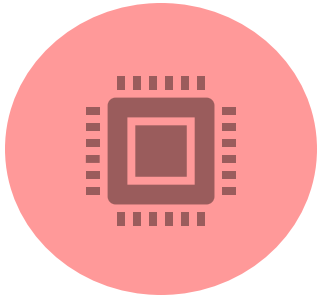


Motor Actuation

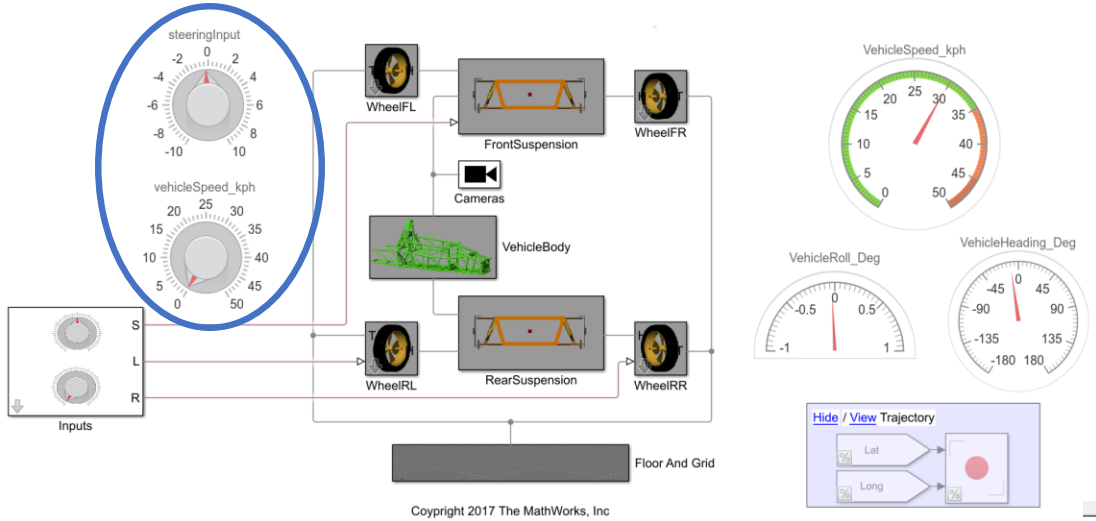
Responsible for circuit safety (wires, ground bar, etc.) and space allocation



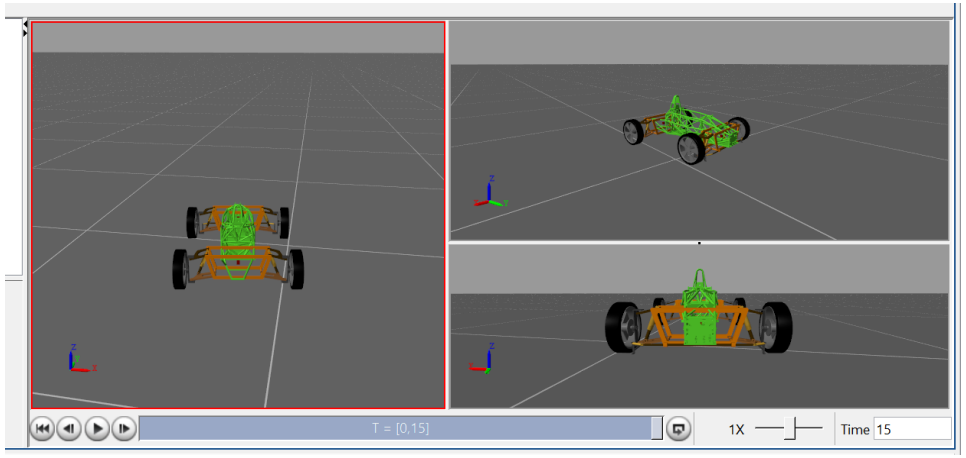


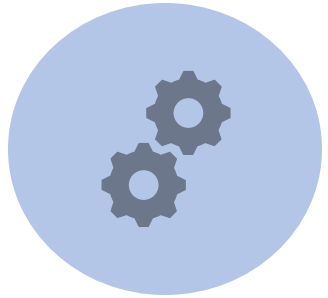


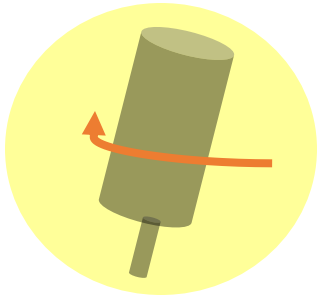
Controls/Simulations

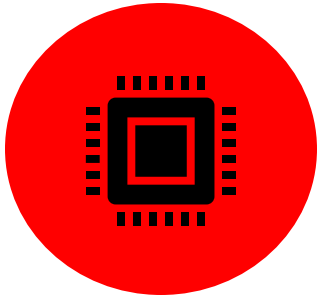


- MIMO System
- Closed loop









Future Work – Steering Actuation

- Purchasing material
- Testing – How to test without irreversible modification
- Test Frame Prototype

Future Work – Motor Actuation

- Maintain space allocation within the driver compartment

Kathleen Bodden

Future Work – Controls/Simulations

- Operating the vehicle independently from T504
  - Program our own microprocessor so that we can still showcase an autonomous vehicle even if it won't be able to track an object

TEAM 503

Richard Allen
Richard3.allen@famu.edu

David Gordon
David2.gordon@famu.edu

Chet Iwuagwu
lli13@fsu.edu

Micah Hilliard
mjh18e@fsu.edu

Nicholas Muoio
nlm19b@fsu.edu

Kathleen Bodden
kmb19b@fsu.edu