Dynamic All-Electric Vehicle with Intelligent Devices (D.A.V.I.D)

Eric Ortiz, Aaron Skonieczny, Alec Hoster, Austin Schaibley, Brindyn Schultz

Engineering Capstone Project, Electrical and Computer Engineering
Advisor: Dr. Yazan Alsmadi

LEWIS UNIVERSITY
A Catholic and Lasallian University

Introduction

The D.A.V.I.D project aims to integrate advanced technologies into an electric vehicle. This project will address safety concerns by introducing driving assistance capabilities such as obstacle avoidance and automatic braking.

Vision

To develop recreational vehicle equipped with LiDAR technology, using enhanced safety through obstacle detection. Our vision is to merge the appeal of recreational vehicles with the benefits of modern technology for a dependable and enhanced driving experience.

Goals

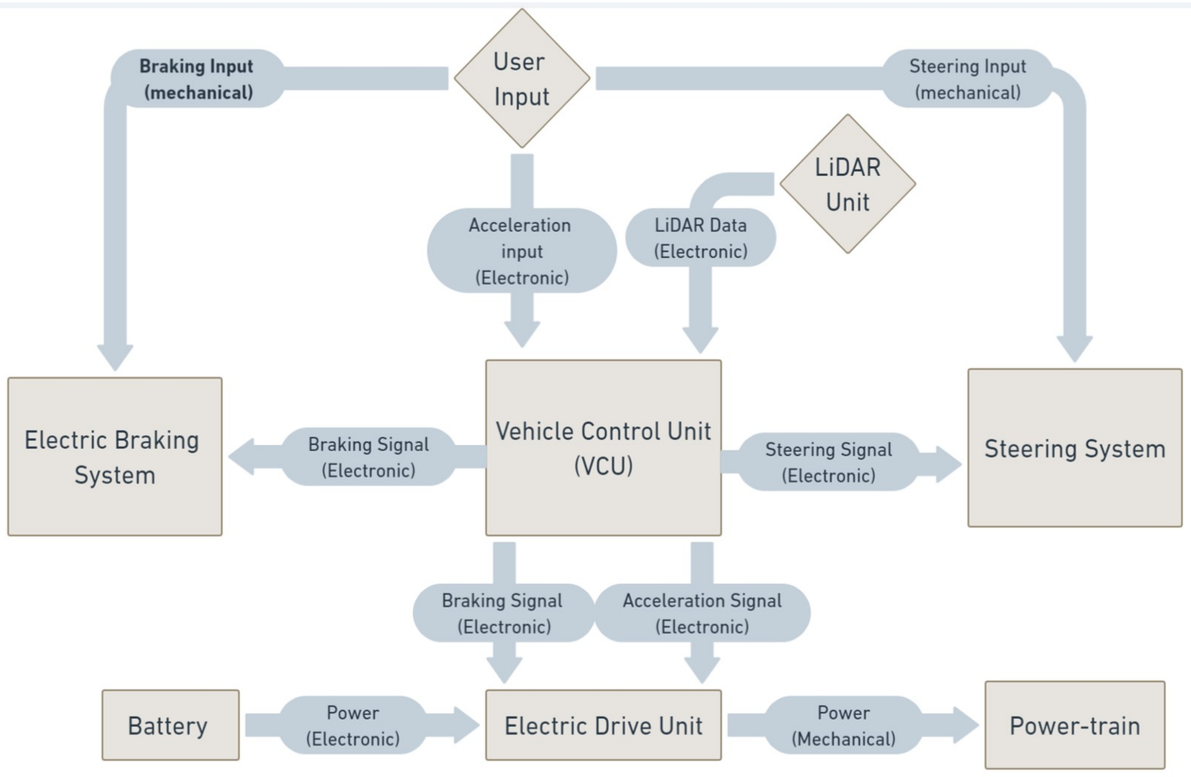
- **Object Avoidance**: Light Detection and Ranging (LiDAR)
  - Target detection Range: 20 meters
- **Vehicle Safety:** Electrical braking and steering
  - Target stop distance 20 meters
- **Electric Propulsion:** Electrically accelerate and decelerate
  - Target top speed: 25 MPH

Problem Description

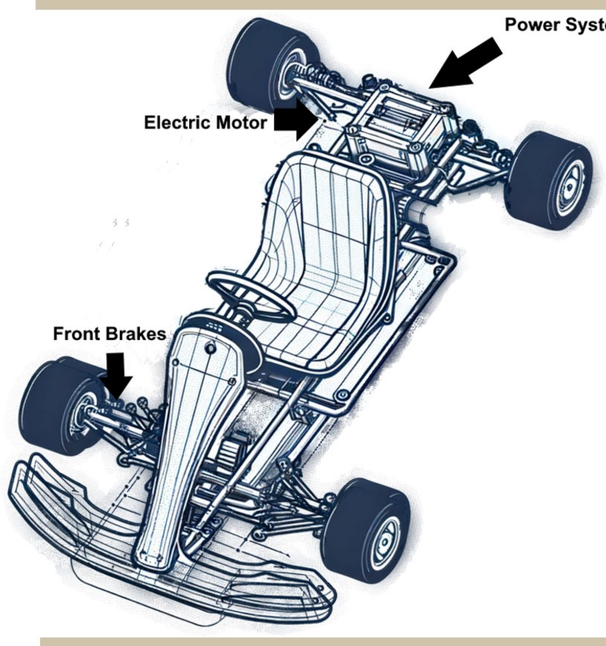
In most recreational vehicles, very few are environmentally safe. They use gas-powered engines producing more carbon emissions than regular vehicles due to lack of regulation. They are also often basic with few features, rarely pushing the boundaries of technology and often lack advanced safety features, such as bucket seats, harnesses, and driver aids such as power steering and braking.

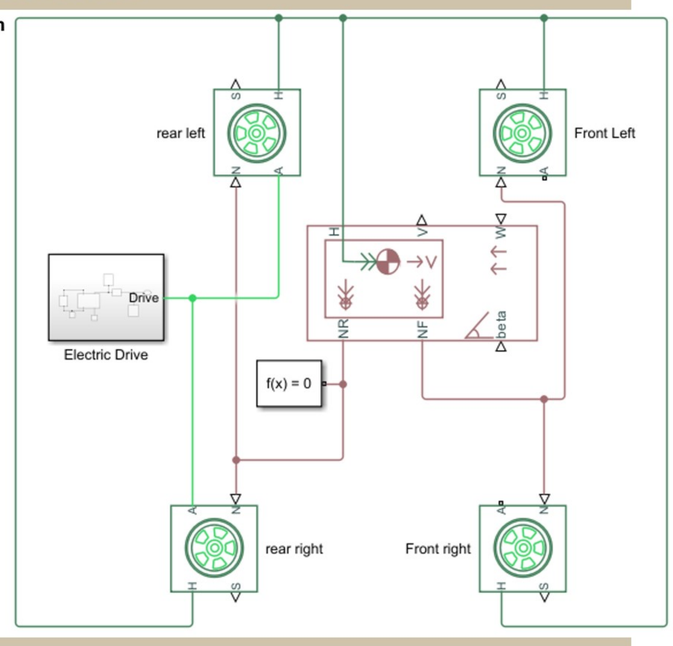
Current Model

The vehicle utilizes a central control module: the Vehicle Control Unit (VCU) to process LiDAR data and electronically control the electric drive unit, braking and steering systems



Simulation





Cart Progression

Challenges and Risks

LiDAR Data Transmission	Real-time feedback
Data Processing Speed	Responsible response speeds
Component Responsiveness	Quickness and Accuracy
Component Durability	Component casing and protection
Battery Risks	Prevent Overheating & over Charge
Environmental Conditions	Protect from Weather

Schedule

October FALL 2023	December FALL 2023	April Spring 2024	May Spring 2024
Product initialization	Design and Simulation	Mechanical Completion	Computations Completion