Electric Moped Conversion
EVO (Electric Vehicle Organization)

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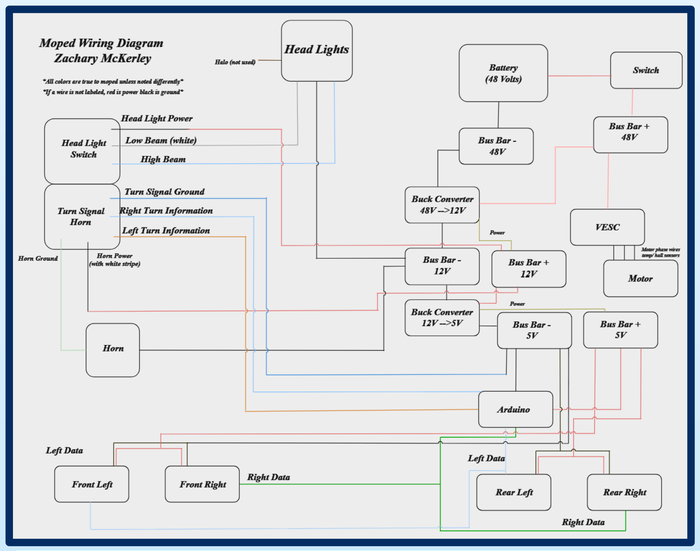
Project Overview

- *To make electric transportation more accessible for students on campus*
- *Get students interested in electric vehicles and participation on projects in student led organizations*

Electronics & Wiring

- *Below is an annotated and simplified wiring diagram highlighting the moped functions*



Contacts

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Moped Information

Battery- 48V 30Ah Battery (1.4kWh)
Motor- 6kW 170 kV
Speed- 47 mph (Limited at 30)
Range- Around 50 miles

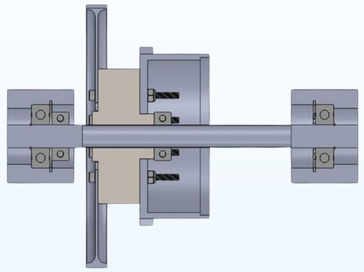
Coding & Turn Signals

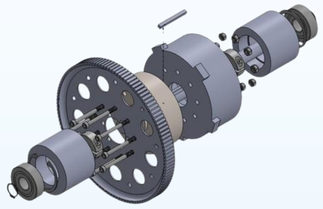
- *Students decided to make programable LED light strips for turn signals which let them utilize many important tools like Arduinos and coding like C++*

```
#include <FastLED.h>

#define BUTTON_PIN_1  0 // Change to the pin your first button is connected to
#define BUTTON_PIN_2  3 // Change to the pin your second button is connected to
#define LED_PIN_1     6 // Change to the pin your first LED strip is connected to
#define LED_PIN_2     9 // Change to the pin your second LED strip is connected to
#define NUM_LEDS     10 // Change to the number of LEDs in each strip

#define LONG_PRESS_DURATION 10 // Define the long press duration in milliseconds
#define ANIMATION_BREAK_DELAY 170 // Define animation break delay in milliseconds

CRGB leds1[NUM_LEDS];
CRGB leds2[NUM_LEDS];

// Function prototypes
void colorWave(CRGB leds[], int numLeds);

void setup() {
  Serial.begin(9600); // Initialize serial communication
  FastLED.addLeds<NEOPIXEL, LED_PIN_1>(leds1, NUM_LEDS);
  FastLED.addLeds<NEOPIXEL, LED_PIN_2>(leds2, NUM_LEDS);
  FastLED.show(); // Initialize all pixels to 'off'
  pinMode(BUTTON_PIN_1, INPUT_PULLUP); // Set the first button as an input
  pinMode(BUTTON_PIN_2, INPUT_PULLUP); // Set the second button as an input
}

void loop() {
  if (digitalRead(BUTTON_PIN_1) == LOW) {
    unsigned long buttonPressTime = millis();

    while (digitalRead(BUTTON_PIN_1) == LOW) {
      if (millis() - buttonPressTime >= LONG_PRESS_DURATION) {
        colorWave(leds1, NUM_LEDS);
        Serial.println("Button 1 is pressed for a long duration.");
        break; // Exit the while loop after executing colorWave
      }
    }
  } else {
    fill_solid(leds1, NUM_LEDS, CRGB::Black); // Turn off all pixels if the button is not presse
    FastLED.show();
  }

  if (digitalRead(BUTTON_PIN_2) == LOW) {
    unsigned long buttonPressTime = millis();

    while (digitalRead(BUTTON_PIN_2) == LOW) {
      if (millis() - buttonPressTime >= LONG_PRESS_DURATION) {
        colorWave(leds2, NUM_LEDS);
        Serial.println("Button 2 is pressed for a long duration.");
        break; // Exit the while loop after executing colorWave
      }
    }
  } else {
    fill_solid(leds2, NUM_LEDS, CRGB::Black); // Turn off all pixels if the button is not presse
    FastLED.show();
  }
```

Photos

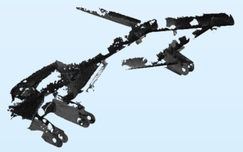
Drivetrain





- *In the above photos it shows the drive train assembly*
- *The drive train utilizes many of our in house engineered and machined parts specifically for this conversion*
- *It uses bearings, snap rings and lock washers to keep everything in place*

LiDAR Scans



**The LiDAR Scan*

**The completed SolidWorks design*

- *Due to the nature of this project's tight requirements, students had to utilize high precision LiDAR scanning technology to design and fabricate vital frame mounts to keep up with the high-quality engineering requirements to ensure rider safety*

References

Club Advisor: Ivo Nedyalkov
Safety Approval: Noah MacAdam
Machining: Scott Campbell