**Communication Protocols and Data Flow**

**Introduction**  
This document provides a brief overview of the communication protocols used between the sensors and the Arduino to manage vehicle control during the race. It covers the data flow and the interaction between components.

**1. Sensor Communication**

1. **IR Sensor:**  
   The IR sensor sends analog data to the Arduino, representing the presence of a line. The Arduino processes this data to adjust the vehicle's movement accordingly.
2. **Ultrasonic Sensor:**  
   The ultrasonic sensor uses pulse signals to measure the distance from an obstacle. It communicates with the Arduino through digital input/output, which processes the pulse return time to determine proximity.
3. **Color Sensors (TCS3200):**  
   The color sensors send frequency output based on the detected colors (blue, red, green, etc.). The Arduino reads this frequency and decodes it to make directional decisions.

**2. Motor Driver Communication**

1. **Motor Driver (L298D):**  
   The Arduino sends PWM signals to the motor driver to control the speed and direction of the motors. It uses 4 digital pins for forward and backward control of each motor.
2. **Power Distribution:**  
   Power is distributed from the LiPo battery to the motor driver, which in turn powers the motors. The Arduino gets its power supply from the same battery, making the vehicle fully autonomous.