Component List for Vision-Based Cruise Control System

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1 Introduction

This document outlines the components required for the development of a vision-based cruise control system for a wheeled mobile robot. The components are selected based on the system's requirements for real-time visual feedback, motor control, and autonomous navigation.

2 Component List

- **Two Wheeled Chassis**
  - The chassis serves as the base structure of the robot, providing support for all other components. It is designed to accommodate two wheels and the necessary electronics.
- **Motors (N20, 6V, Encoder)**
  - Two N20 motors with encoders are used to drive the wheels. The encoders provide feedback on the rotational speed and position, essential for precise control of the robot's movement.
- **Motor Driver (L298N)**
  - The L298N motor driver module is used to control the motors. It receives signals from the microcontroller and adjusts the power supplied to the motors, enabling speed and direction control.
- **Raspberry Pi Board**

  - The Raspberry Pi serves as the central processing unit for the system. It runs the control algorithms, processes camera feedback, and interfaces with other components.

- **Camera Module (PiCam/USB Cam)**
  - A camera module, either PiCam or USB Cam, is used to capture real-time visual data. This data is processed to detect obstacles, identify paths, and make navigation decisions.

- **OLED Display for Raspberry Pi**
  - A small OLED display is used with the Raspberry Pi to show system status, including battery level, connection status, and other relevant information. This display provides a compact and efficient way to monitor the robot's state.

- **Battery and Charger**
  - The robot is powered by a rechargeable battery, providing the necessary voltage and current to all components. A compatible charger is used to recharge the battery.

- **Power Distribution Board (PDB)**
  - The PDB distributes power from the battery to various components, ensuring a stable and reliable power supply.

- **Wires and Connectors**
  - Various wires and connectors are used to establish electrical connections between components. This includes jumper wires, power cables, and signal wires.

- **Headers and Pin Connectors**
  - Headers and pin connectors facilitate the connection of components to the Raspberry Pi and other modules. They provide an easy and secure method for connecting and disconnecting components.

3 Conclusion

The selection of components for this project is crucial to achieving the desired functionality and performance. Each component plays a vital role in the system's overall operation, from capturing visual data to controlling the robot's movement. The combination of these components aims to create an efficient and reliable vision-based cruise control system.