The Hockey Guru

2022 Mobile Robot Term Project Proposal

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During the 4 checkpoints of this course, we are constantly thinking about how to optimize our hockey robot to the greatest extent. For us, the term project is an excellent opportunity for us to make a major upgrade to our hockey robot. We'll pull out all the stops to turn our hockey robot into a hockey guru.

In our term project, we are planning to add two additional sensors to our hockey robot, which are the Ultrasonic Sensor Module and the IMU Sensor Module, and the roles of these two sensors in our hockey robot are as the following:

- **Ultrasonic Sensor Module - RB URF02**

  Currently, our hockey robot can only rely on two touch sensors mounted on the front of the robot for obstacle avoidance. If we want to move ahead of an obstacle, the only way is to let the touch sensor on the front of the robot touch the obstacle and avoid it. Therefore, we hope that by installing an ultrasonic sensor on the hockey robot, the robot can judge whether there is an obstacle ahead by measuring the change in the distance, and can react in advance without encountering the obstacle.

- **IMU Sensor Module - GY-85 9DOF**

  Due to the low precision of the motors used in our hockey robot, although we use a PID controller to precisely control the rotation of the two motors, we have recorded that there will still be some errors in operation. These small errors can add up to a considerable amount the longer the robot is on the field. Therefore, we hope that by adding an IMU, we can correct our direction in real-time, and replace the time required by the original hockey robot to correct on the field through real-time adjustment.

By combining the advantages of these sensors, we hope our hockey robot can not only complete the most basic operations in a shorter time but also hope that our hockey robot can accomplish tasks with higher complexity, such as S-type obstacle avoidance, hitting the hockey puck into the goal on the other side, etc.