##### RSC Bot

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PROJECT DESCRIPTION:

This goal of this project is to automate the movement of material, supplies, etc. between two locations by creating an autonomous delivery bot. The objectives are to increase work safety, maximize time efficiency, and decrease the human dependence on moving around constantly.

**Problem:**

The autonomous delivery bot will automate and implement a small-scale delivery system. The bot will move from point A to B and back. For proof-of-concept, scheduling of the deliveries and stops will be pre-programmed. If time-permitting, the scheduling can be entered on demand and followed by the bot.

**Technical Approach:**

The RSC bot will receive an input signal from user either from keypad or over Bluetooth to traverse the path A-B and B-A. Additionally, we will interface a motor driver to drive the servos. The speed of servos can be controlled by a Proportional–integral–derivative (PID) controller and can be implemented in the microcontroller. We will interface proximity/distance sensors to detect obstacles and to follow a set path. The distance sensing will be implemented by Passive Infrared (PIR) sensors and will track the movement of the bot along the path. Proximity sensing will be implemented by ultrasonic range sensors to detect obstacles and avoid collisions. For example, if the obstacle is within a certain range, the microcontroller will send control signals to the motor driver to slow down or stop the bot. We will also design and assemble a power circuit to accommodate different voltages. When the RSC bot will receive a signal to turn back from point B, a relay will be activated which will use a servo to turn the bot around.

**Project Deliverables:**

We will design and implement the full system using several components including robust chassis (sponsored by Austral Star, Inc), battery, Arduino microcontroller, servos, LEDs (for visual warnings), and other peripherals. Other hardware components will include the obstacle avoidance sensor, line following sensor, motor drivers and pertinent PCBs. For the user input, we will use a simple widget app or keypad.

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| FACULTY APPROVAL: | DATE: |
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| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_ (Dr. Suketu Naik, Faculty) |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_ (Dr. Christian Hearn, Faculty) |
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