Maze Mouse

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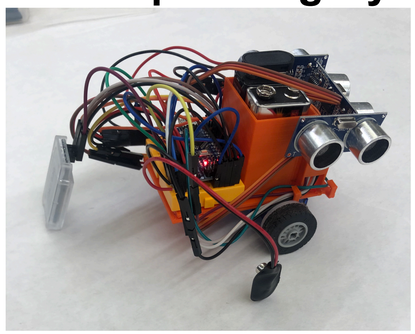
Squeaking By



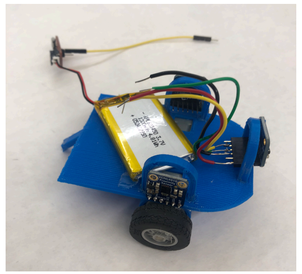
Our robot moves using feedback from three ultrasonic range finders. The outputs of the three sensors are recorded and used to determine the state of the robot (whether it has reached a dead end or is approaching a junction). Our code then decides the appropriate action based on weighted sensor readings. A Bluetooth module sends data wirelessly that displays the robot's current state.

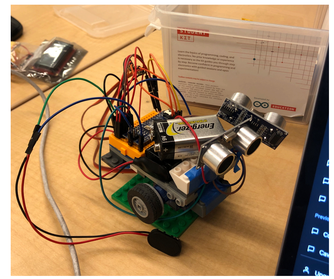
Of Mice and Maze

The maze is a 75x75 cm gird of customizable terror. The individual cardboard pieces can be be adjusted according to our specifications to challenge our robot. Any simply connected maze, designed without loops or inaccessible areas, can be solved by hugging the right or left wall. Our robot uses this fact to its advantage.

Maze Mouse

Iterations





Initially, the mouse moved using two hobby DC motors and three IR sensors. Limitations in the output torque of those motors as well as the available I2C ports in the Arduino Nano caused us to change our approach. The current design uses two continuous rotation servo motors and three ultrasonic range finders powered by two 9V D batteries.

Inspiration and Challenges

Will they escape?

Moving in a straight line was particularly challenging for this little guy. The first method of locomotion moved the robot away from walls a distance proportional to how quickly the mouse was moving. Using this method, maze mouse struggled to cleanly clear corners. In our final implementation, we utilized a feedback system that would take into account differences in our desired distance to a particular wall and our sensors' actual distance readings. Our robot would make proportional velocity adjustments based on these errors.