A-maze-ing Robot

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EXTENDED ABSTRACT

The purpose of this project is to construct a Lego Mindstorms robot that is able to successfully navigate a maze from start to finish and map its progress. From the information gathered, the robot should be able to follow the quickest route from the end of the maze back to its starting point.
The robot will be built using the materials available in the Lego Mindstorms kit. The dimensions of the maze will be 6' x 6'. It will be divided into 1' x 1' cells, creating a 6 x 6 grid. Two mazes will be designed given this standard. Each maze must include one of the seven types of intersections possible. In addition, the mazes should be constructed as perfect mazes, which means that they are composed of only two pieces and contains only one solution.

Several algorithms to solve the maze will be written and programmed into the robot. In addition, the robot will be programmed to document its progress through the maze into its memory. Finally, a third program will be written to understand the documentation program and follow the quickest route back to its starting position.

The robot will be using supersonic sensors to navigate through the maze. It will have a sensor for each cardinal direction besides the rear of the robot. Since the algorithms that will solve the mazes understand that if the robot moves to a different cell, the cell it came from will be empty. Therefore, it eliminates the need for a rear sensor.

In the end, the information gathered by the robot from the documenting program should be presentable. One should be able to retrieve the information from the robot and publish it such that the information is understandable.