

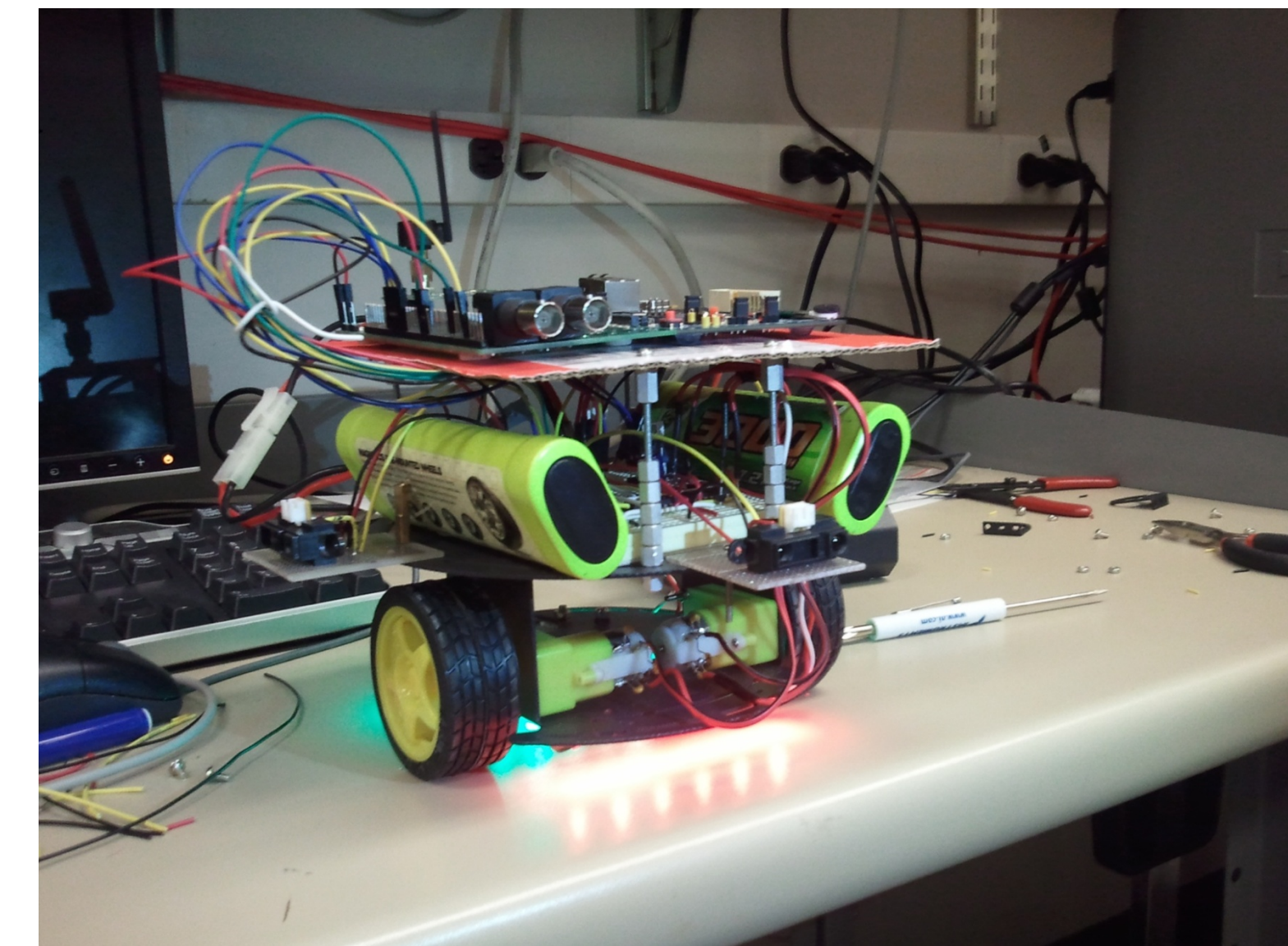
Remote-Controlled, Robotic Maze Mapper

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Introduction

- We created a robot that traverses through a maze. The robot is controlled by a user who cannot see the maze and must rely on feedback from the robot to navigate through the maze. This user accomplishes this by having access to a simple controller and an LCD display. The user guides the robot wirelessly using the controller and the robot then wirelessly relays information on wall positioning back to the user, which is then shown on the LCD display. As the robot moves through the maze, more of the overall maze is uncovered and visible for the user to see and navigate through.

Roxie the Robot



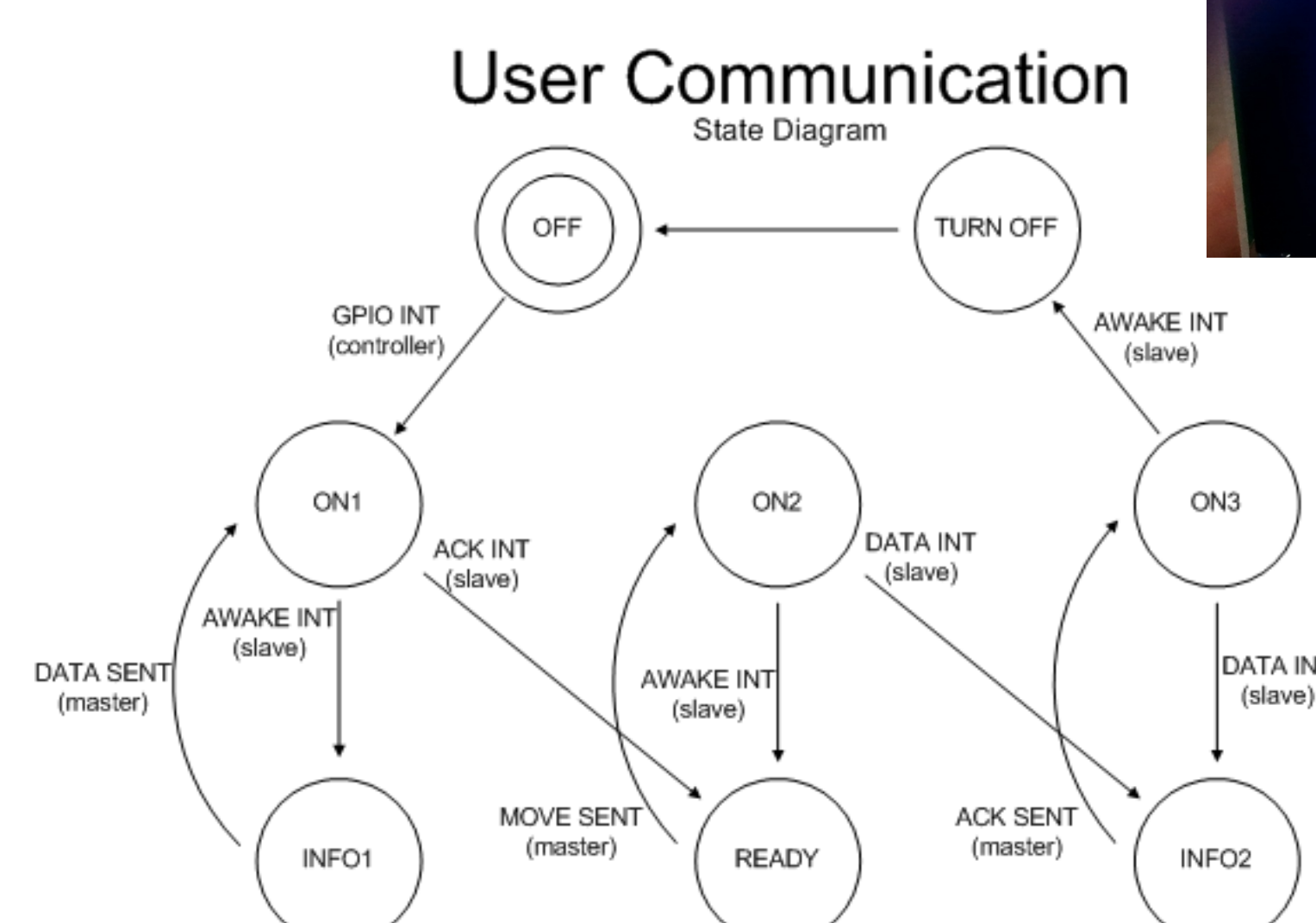
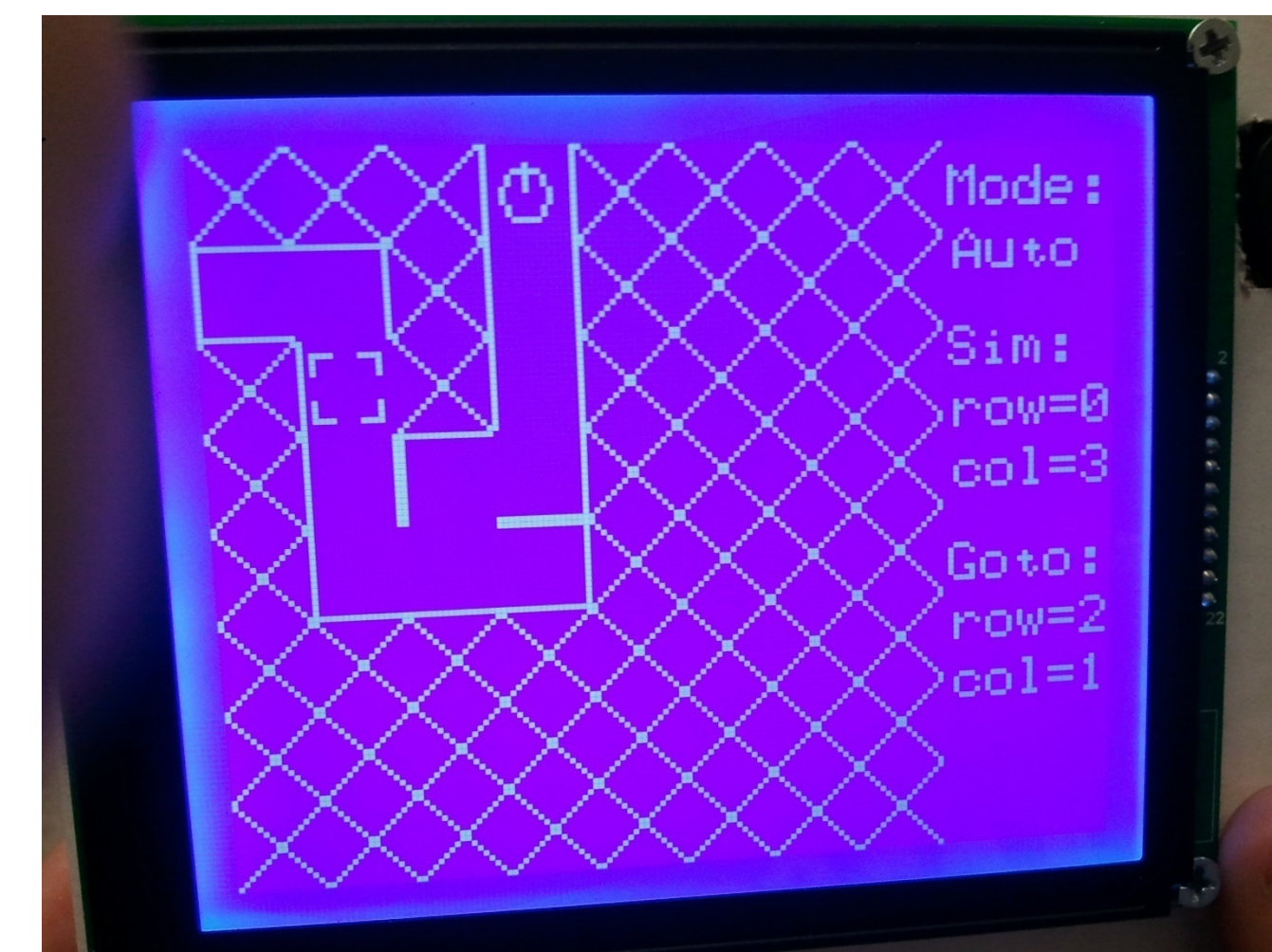
Project Goals

- Design a robot that regulates power supplied to its wheels' motors, allowing it to be controlled and directed on how to move through a confined area of space
- Gather sensor information pertaining to the surroundings of the robot, allowing the user in control to receive feedback on wall positioning and directions in which the robot can move freely
- Set up a wireless protocol that effectively allows the user to send the robot movement commands and then receive information back from the robot on the positions of any walls at the new location, while trying to maintain a low power consumption

Project Implementation

User

- Control:** The user controls the robot using an N8 controller, which uses latch/pulse technology.
 - D-pad used to move around maze
 - A/B/start/select buttons switch between various modes
- Display:** As the robot is in a "blind" maze, the user must rely on an LCD display to keep track of maze information.
 - Lines drawn on screen to represent walls sent from the robot's sensors
 - Miscellaneous mode and position information on right side of screen



Robot

- Robot:** The actual robot is a simple circular chassis with two wheels each powered by their own motor.
 - Circuitry designed to regulate the power consumption of each motor, the Actel board, and the infrared sensors
 - Able to move one "unit" of distance forward, left, right, and backward
- Sensors:** Infrared sensors are mounted on the robot that provide voltage feedback relative to distance.
 - 4 sensors total: front, back, left, right
 - Provide wall positioning information for the user at each location

