Autonomous Robot Platform

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ECE 298

The Project

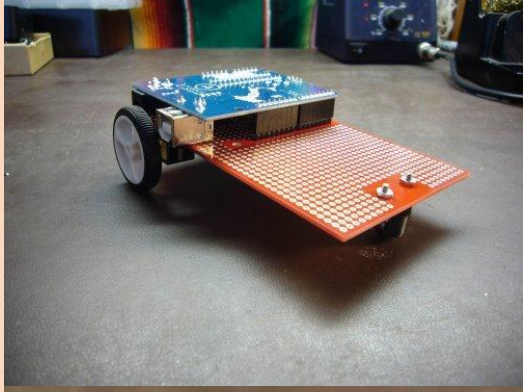
To create a low-cost autonomous platform, to be used as the basis for other projects

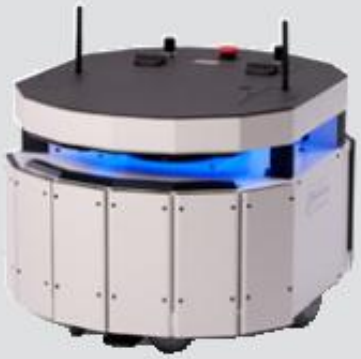
Why?

- Autonomous navigation and wireless communication are difficult
- Building the basic structure is not what many people want to do
- Hobbyists and students who want to build a robot may not have the knowledge, experience, or time to build it from scratch

Existing Solutions

- 3pi, Ardubot, and other small hobby robots
  - Not fully autonomous
- Roomba
  - Not designed for this use
- Commercial autonomous robots
  - Cost thousands of dollars
- The ideal solution does not exist



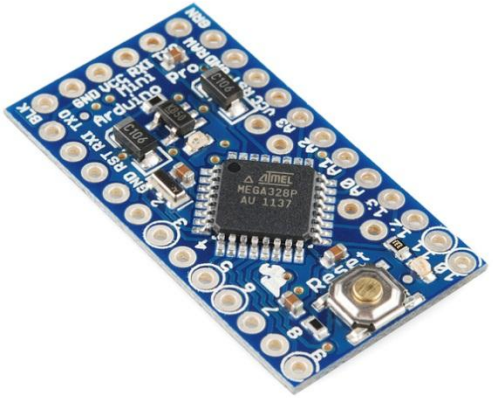


Shortened Constraints & Criteria

- Inexpensive (ideally under $400)
- Autonomous
- Easy to use
- Communicates wirelessly
  - With other robots and control computer
- Can be used as a foundation for other projects

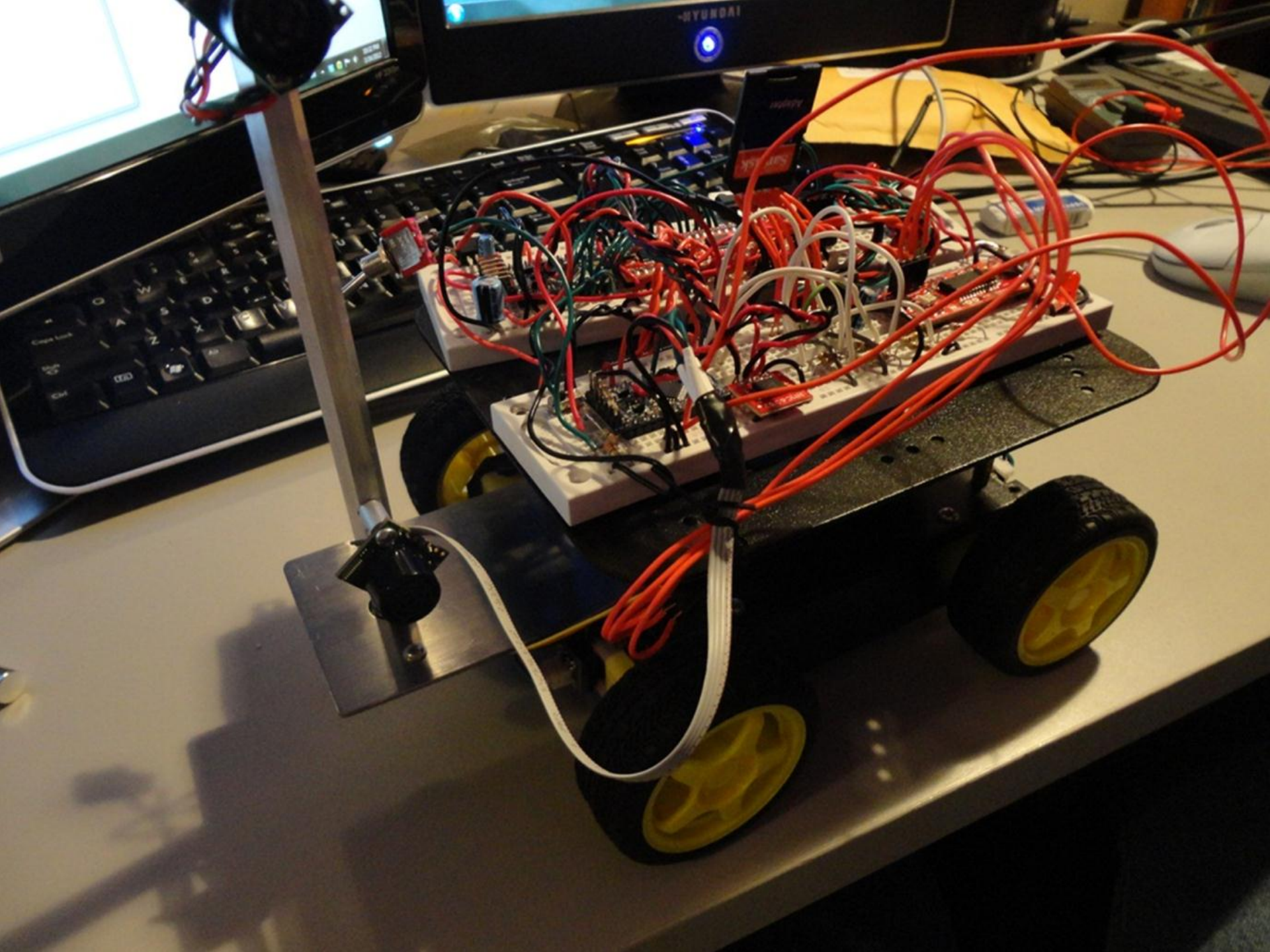
Work done this semester

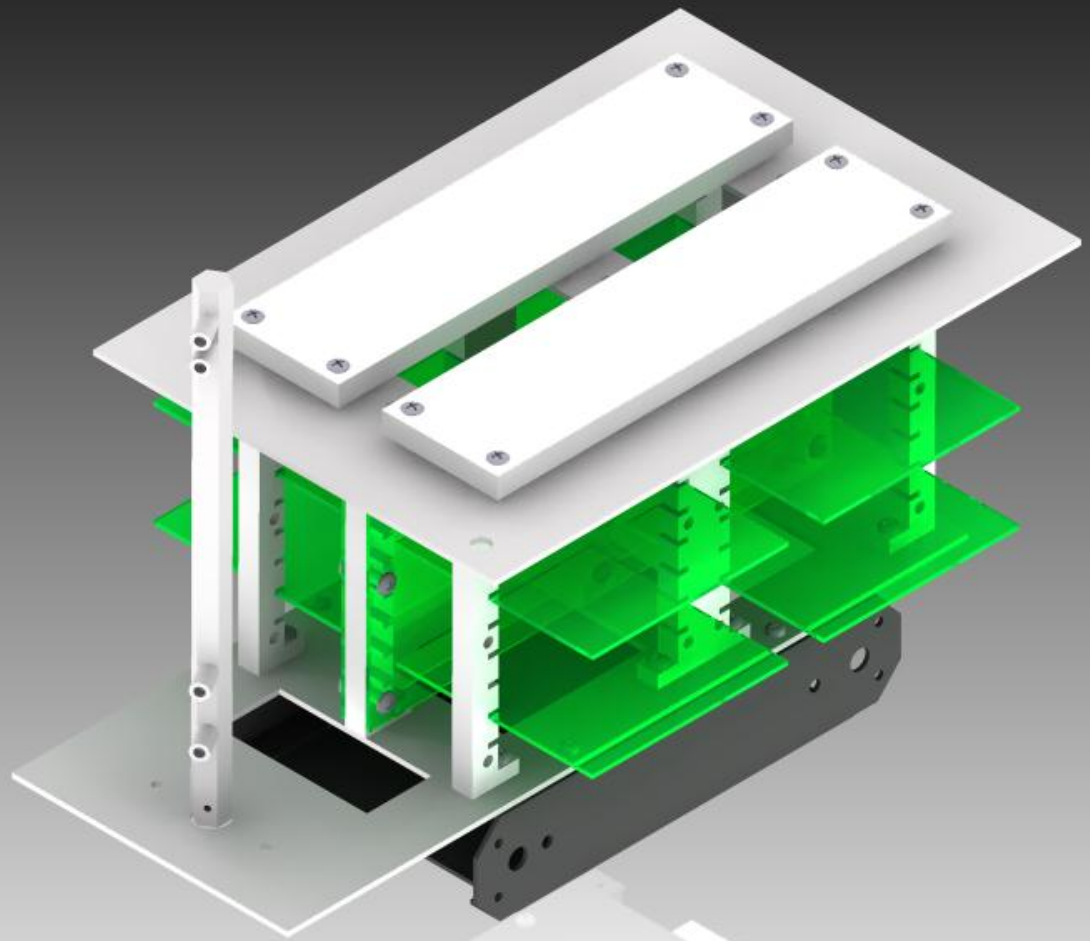
- Started with chassis & motor kit
- Controlled by two Arduinos
- Added ultrasonic sensor
- Wrote code for obstacle avoidance
- Started designing rack system

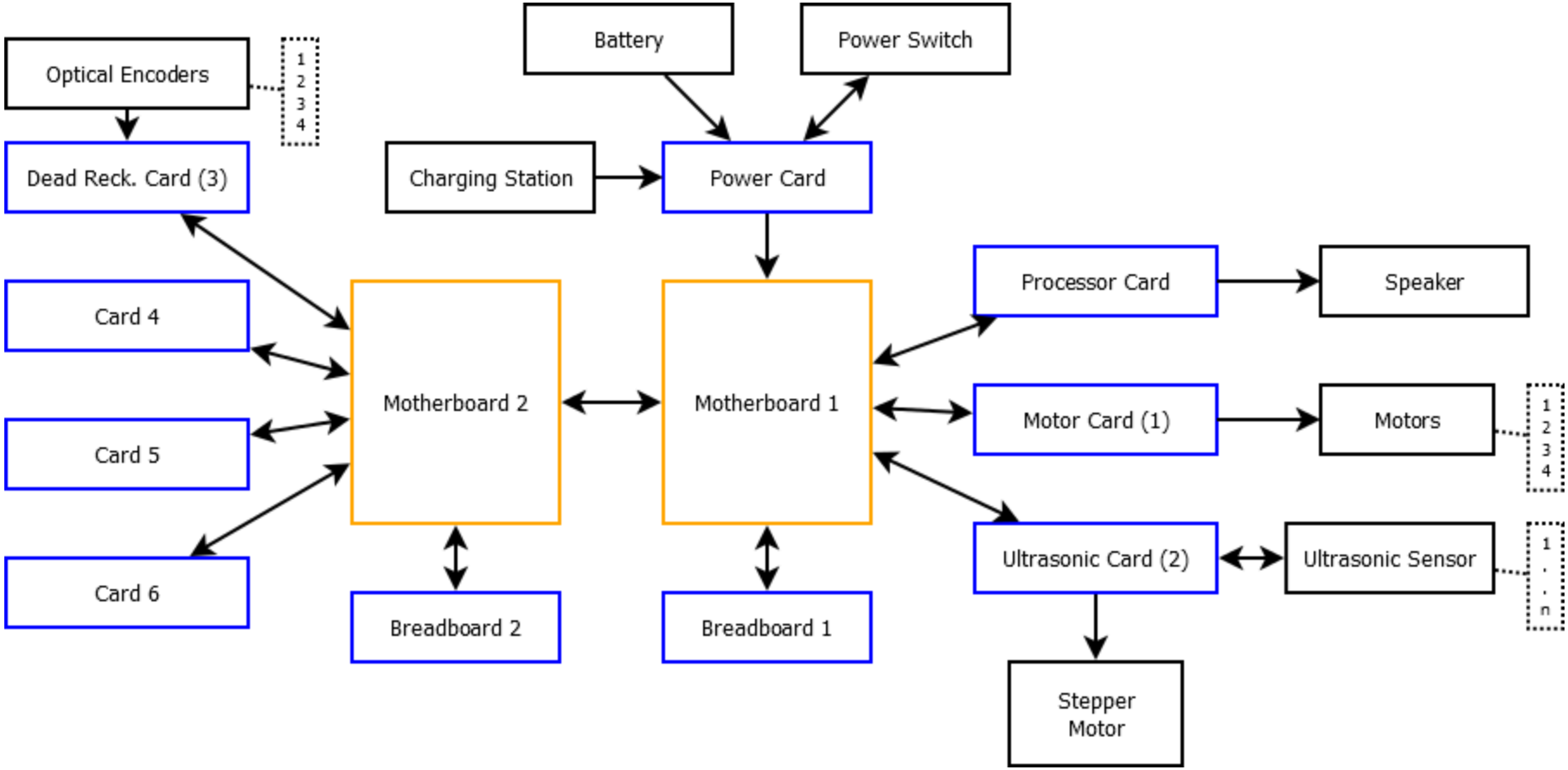


The Present

- Robot does not see all obstacles
- Circuit boards for rack system need designed






Optical Encoders
1
2
3
4
Dead Reck. Card (3)
Battery
Power Switch
Charging Station
Power Card
Card 4
Card 5
Card 6
Motherboard 2
Motherboard 1
Processor Card
Speaker
Motor Card (1)
Motors
1
2
3
4
Ultrasonic Card (2)
Ultrasonic Sensor
1
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n
Breadboard 2
Breadboard 1
Stepper
Motor

The Near Future

- Larger team – 2 or 3 people
- Next level of navigation: maze navigation
- Map creation
- Basic control system
- Implement rack system
- Wireless communication

Q & A