

## Team 19: IEEE Region 5 Robotics Competition

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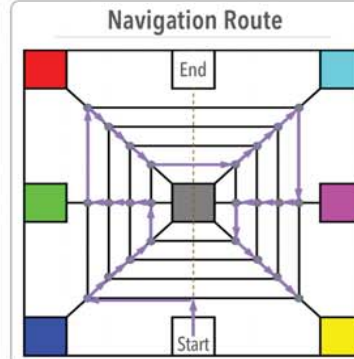
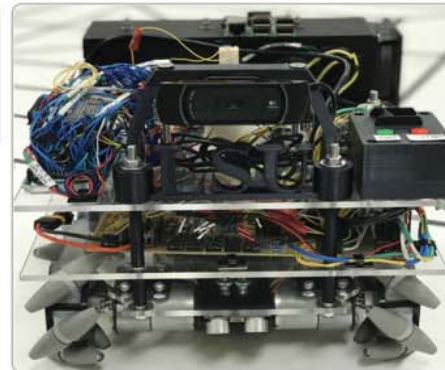


### Objective Statement:

The objective of this project is to design and build an autonomous robot that will identify, retrieve, and deliver colored tokens to like-colored squares within a time limit.

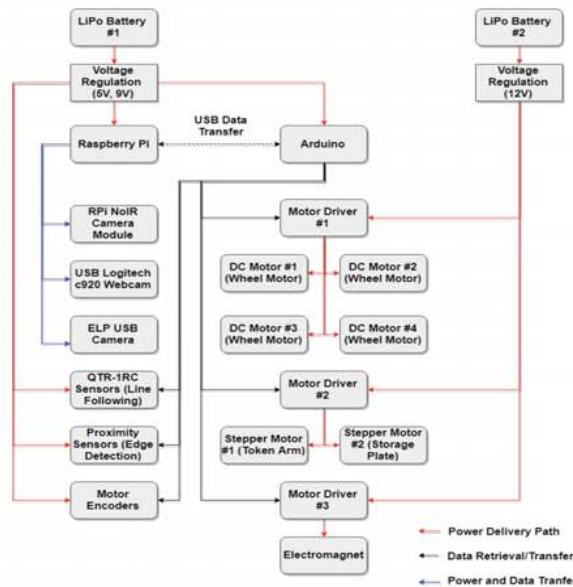
### Design Concept:

This design can sort and store tokens, allowing for a static route and the fastest theoretical completion time. A Raspberry Pi uses data from several types of sensors to make navigation decisions. Tokens are collected using an electromagnet, which travels vertically through the robot.

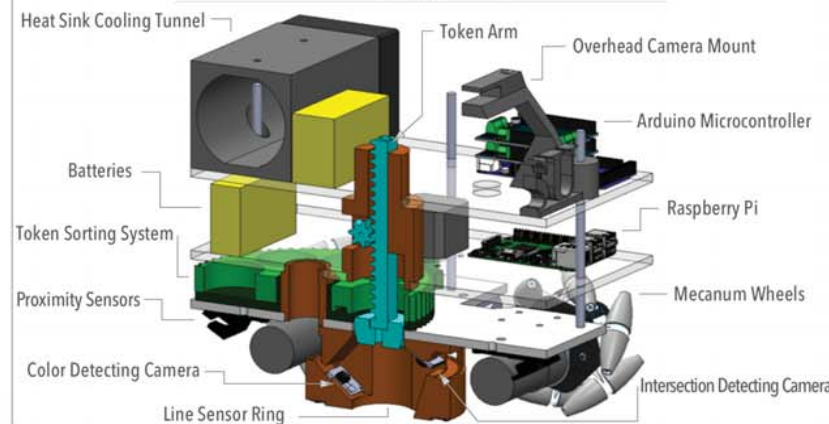


Functional Requirements	Qualitative Constraints
Fully Autonomous	One Contiguous Piece
Detects Color	No Volatile Substances
Stop / Go Designation	No Human Interaction
Collect/Deposit Tokens	Remain Within Playing Field
Begin/End On White Square	Stop / Go Buttons
Navigates Playing Field	No Flying/Drone

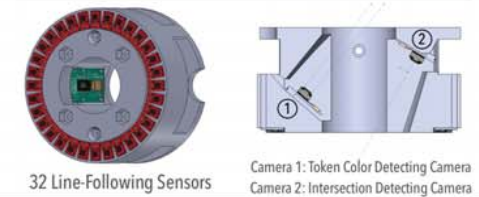
### Hardware Interaction



### Prototype Model



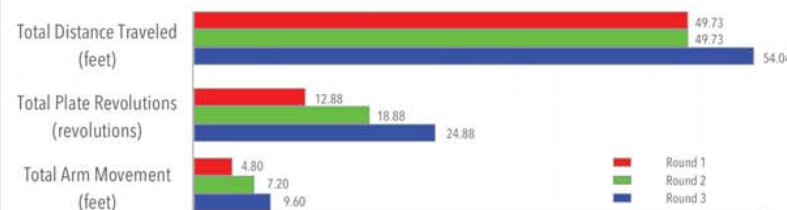
### Sensor Orientation



### Budget



### Quantitative Robot Movement



### Safety Considerations

- Wire Management
- Emergency Power Shutoff
- Fuses
- Stop / Go Pushbutton
- Battery Safety / Care
- Overheating
- Enclosure For Token Arm

### Conclusion:

The robot was designed and built to specifications in order to autonomously navigate the playing board, retrieve and identify tokens, and place them in their color-respective squares using computer vision and line detection.

**Project Sponsor:** Professor Gabriel DeSouza  
**Faculty Advisors:** Dr. Ramachandran Vaidynathan, Dr. Jin-Woo Choi