Team 506: Autonomous Material Handling Robot

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Objective

The objective of this project is to create a partially autonomous material handling robot that works in a dark warehouse with conditions unfavorable to human workers.

Project Background

Dark warehouses with increased automation are the warehouse of the future.

Automated robots can work in an assembly line, reaching for parts in a nearby box.

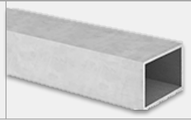
Our robot's job is to retrieve boxes of materials for the assembly line robots when they are running low at their station.

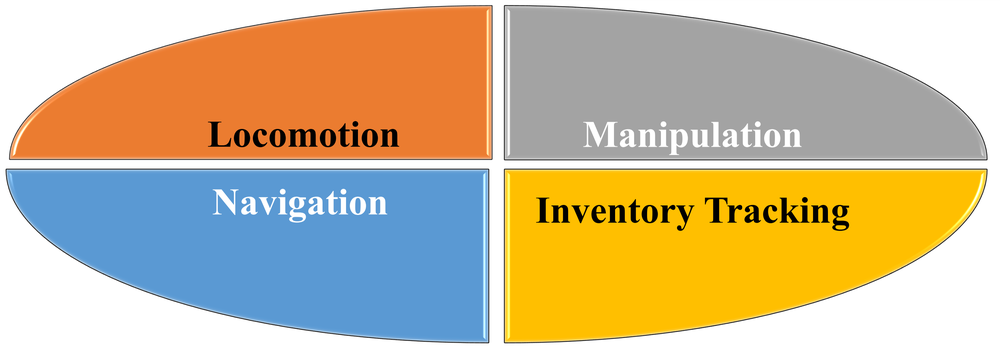
Goals

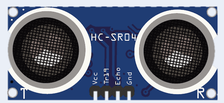
- Navigate warehouse
- Locate, deliver, and retrieve inventory
- Obstacle detection
- Minimal human assistance
- Independent charging

Concept Selection

Omni Wheels	DC Motors
	

FORKS	PULLEY
	
SLIDER	**MAST**
	



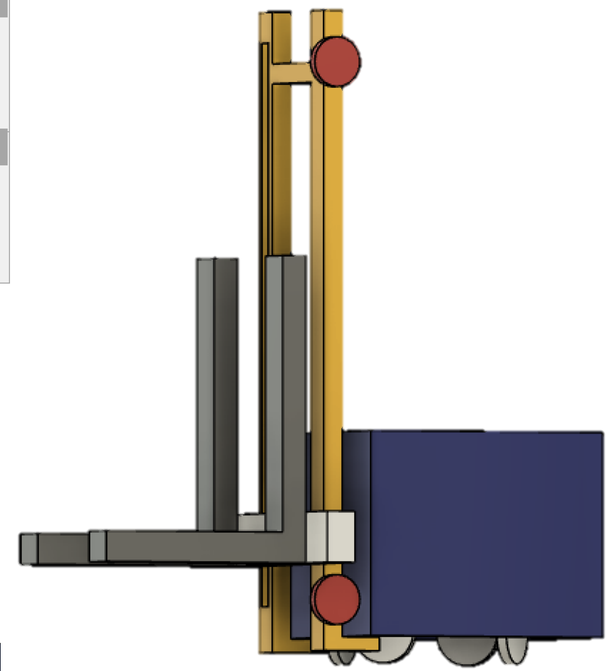
LINE PATH	ULTRASONIC SENSOR
	
INFRARED SENSOR	**PI CAMERA + WIDE LENSE**
	

Arduino	Raspberry Pi Model B+	QR Codes
		

Critical Targets and Metrics

- 360 Degree Turning Motion
- Even Torque (<1% Error)
- Lifts Maximum 50 lbs
- Connects Wirelessly (1)
- Locate Inventory (1)
- Scan Inventory (1)

Final Concept Idea



Future Work

- Design function lifting mechanism
- Incorporate path finding algorithm for navigation
- Incorporate all hardware and sensors into the system
- Assemble all system components