IEEE SoutheastCon Student Hardware Competition: Team 301

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Summary

For the IEEE SoutheastCon 2020 Hardware Competition the goal is to make an automated robot that can complete at least one of the challenges. Different points are awarded for different tasks, and the objective is to get the most points in 3 minutes.

Challenges

There are two challenges, to stack Legos and push buttons. Each challenge is given points as shown in the figure below.

- Lego stacking: stack as many Legos in pi order where different colored Legos represent different numbers.
- Button pushing: push as many buttons in pi order where different buttons represent different numbers. Any additional button presses that are out of order will be added to the total, but this number is capped at 100.

Description	Number of points
Total stack sequenced correctly	20 * N * N
Additional stack not sequenced correctly	N * N
Total button presses sequenced correctly	10 * N
Additional button presses not sequenced correctly	N (max of 100 counted)

Design

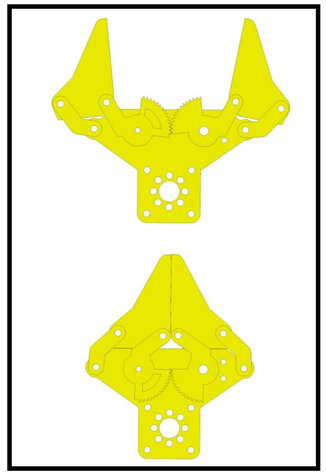

Figure 1. Gripper opened/ Closed

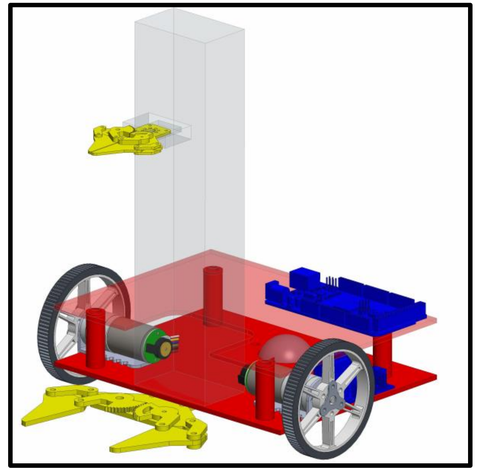

Figure 2. Robot Prototype

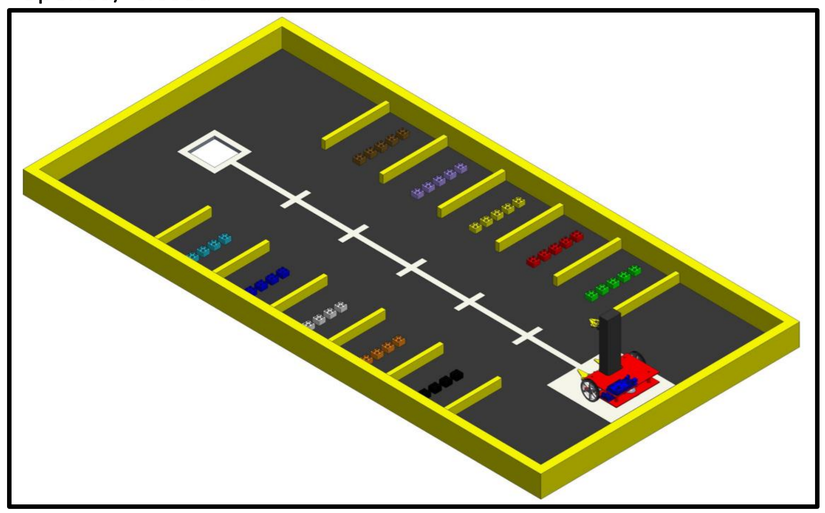

Figure 3. Robot in play arena

Development Tools

Software used:

- *Arduino IDE* – Microcontroller
  - The automated system that governs the robot will be deployed on an Arduino Mega.
  - The system will be coded using C++
- *CAD* – Design
  - Creo was the software used To develop the robot design

Future Work

Mechanical Design:

- Assemble prototype for initial testing
- Finalize design and dimensions

Software Design:

- Navigational system
  - Line following and line counting algorithm
- Stacking
  - Elevator and gripper control

Electronic System:

- Assemble electronic components

Acknowledgements

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