



Southeast Con 2019 Hardware Competition

FAMU-FSU
Engineering

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Introduction To the Competition

The IEEE Southeast Con is a national annual robotics competition that is being hosted in 2019 at the Von Braun Center in Huntsville, Alabama from April 11, 2019 through April 14th, 2019. The robotics competition for this year involves designing an autonomous robot that can clean up debris on the playing field and return home, while also sorting the debris. The debris located on the field will also vary between four different colors. During the competition, multiple other robots will be actively playing against each other and points will be deducted if robots collide.

Objective

To clear orbital space debris while avoiding Spacetels and return to home base within the time limit of three minutes. The score is determined by a number of factors including:

- 1) the number of complete playing field orbits
- 2) the number and type of space debris cleared
- 3) sorting cleared debris
- 4) returning to assigned corner square (home base)
- 5) avoiding collision with Spacetels.

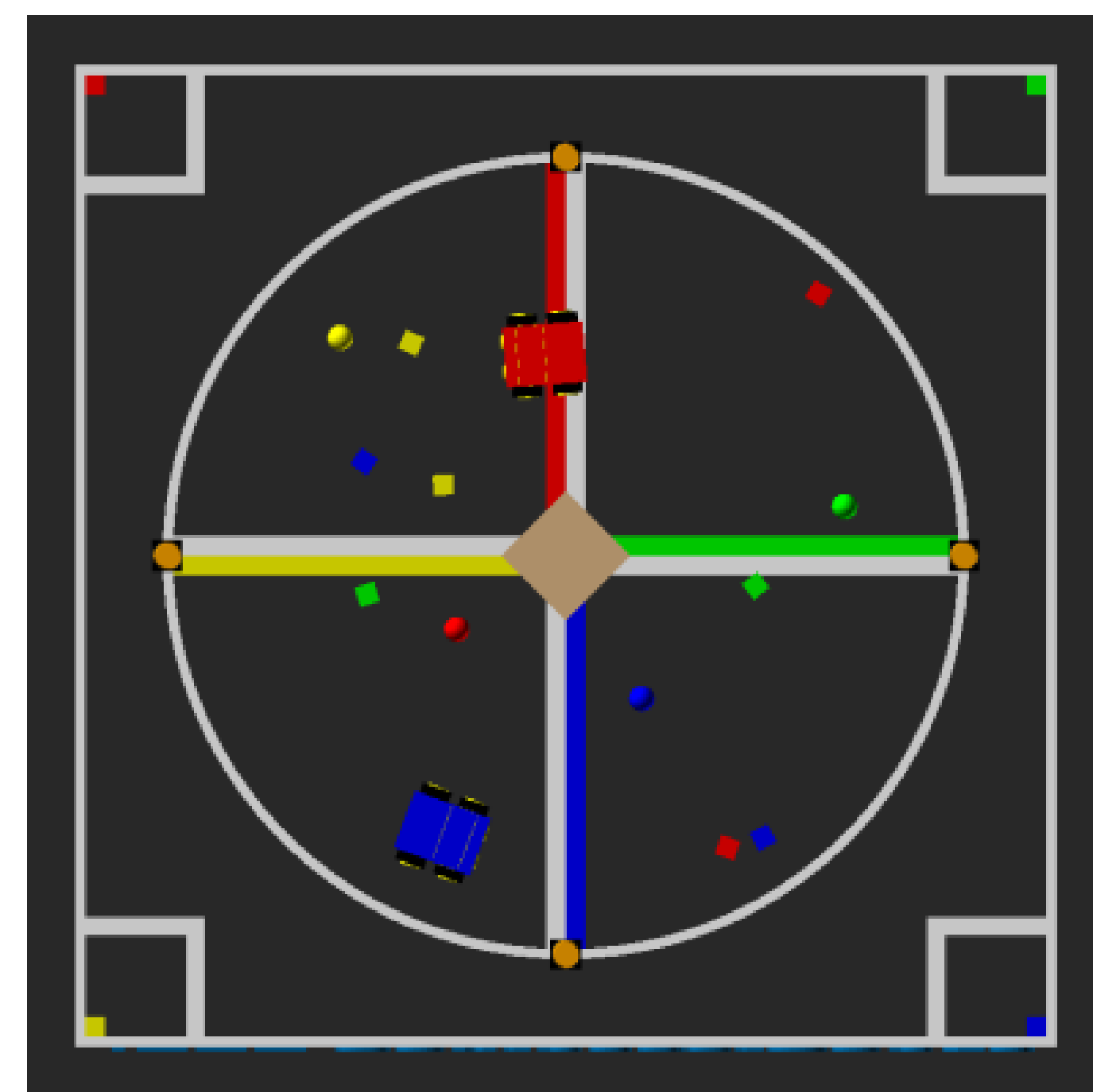
Competition Constraints

- The robot must fit within a 9 in x 9 in x 11 in cube while moving (L x W x H)
- The robot must be entirely self-contained
- When not in motion the robot can extend a maximum of 3 in x 3 in (L x W)
- The extension must be physically connected to the robot at all times
- Pyrotechnics, compressed gas, hydrocarbons, toxic or corrosive materials are not allowed
- The robot must have a 1-inch high bumper around 80 % of its perimeter

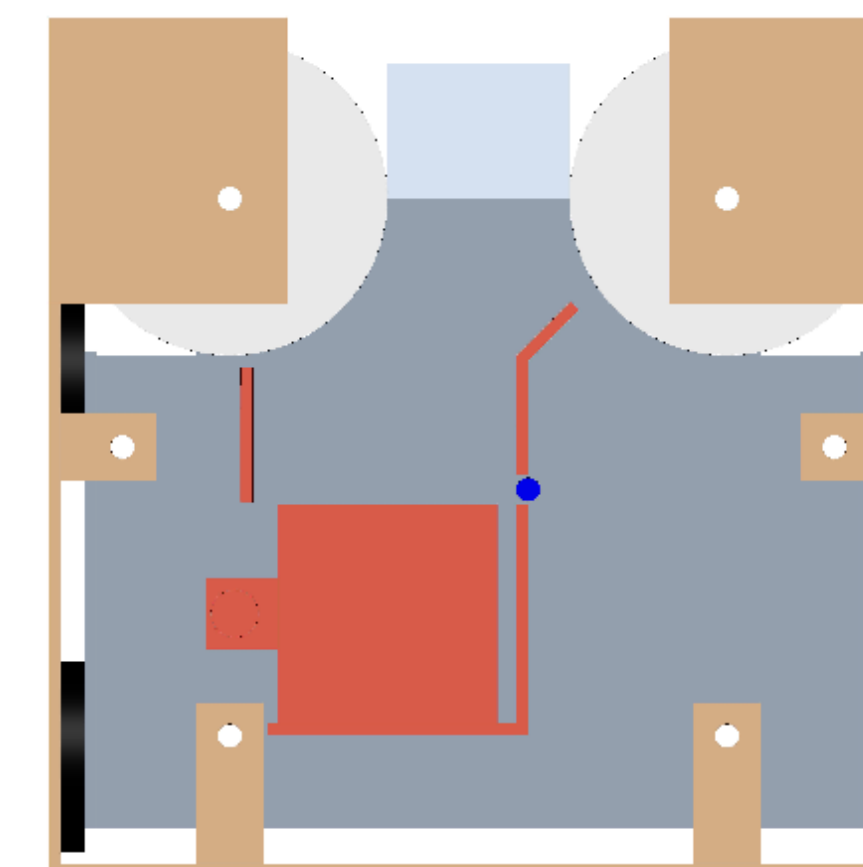
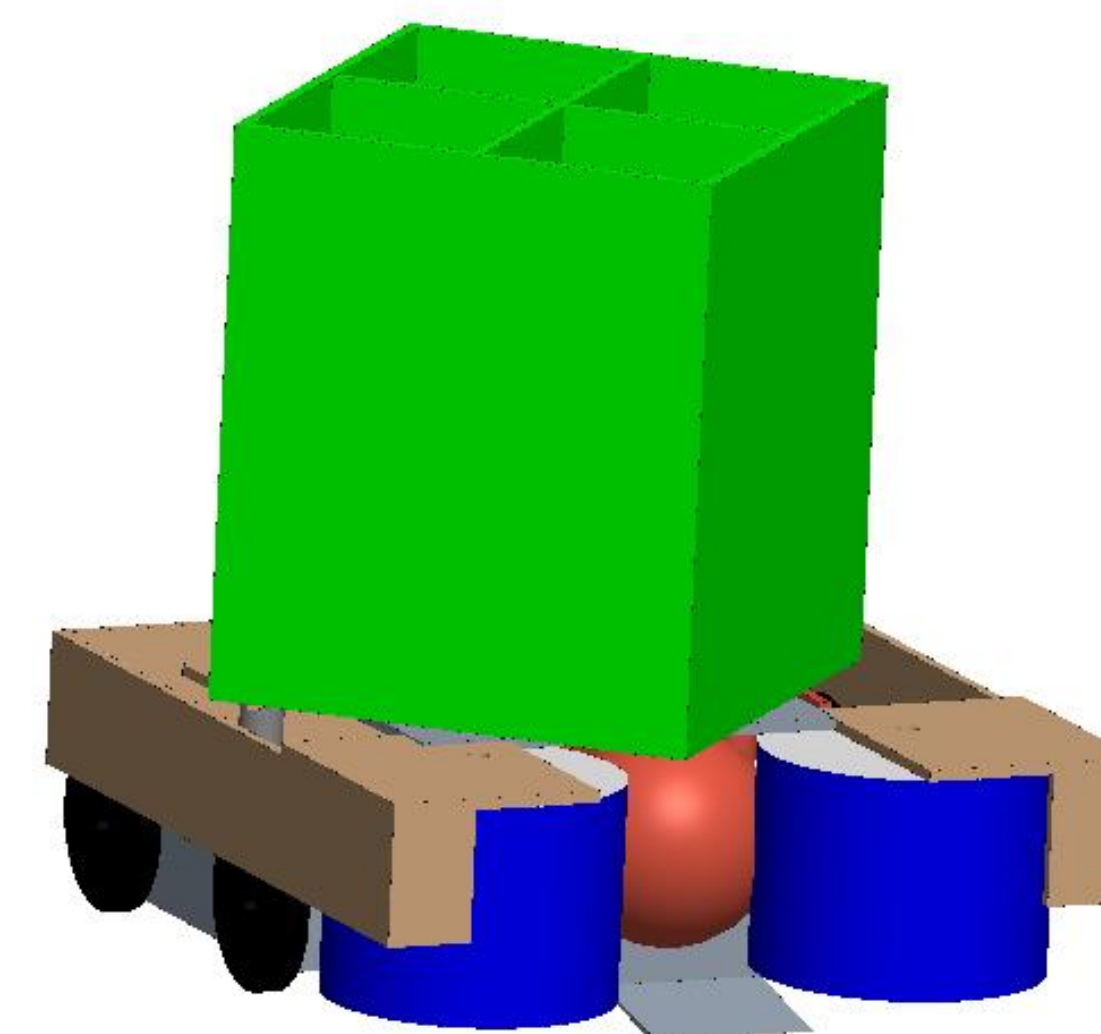
Point System

Points	Task
5 Points	Leave home base and enter Zone 1
5 Points	Cross the orbital line into Zone 2 (first time only)
5 Points	For each complete, counter-clockwise orbit within Zone 2, starting from the quadrant closest to designated corner square
10 Points	Debris removed from Zone 2 (each)
10 Points	Debris placed in home base (additional to removal)
10 Points	Color-matched debris placed in appropriated color corner square (bonus points)
10 Points	Finish in your home base
25 Points	At conclusion of debris removal, raise your onboard flag while in home base
-10 Points	Every collision with a Spacetel

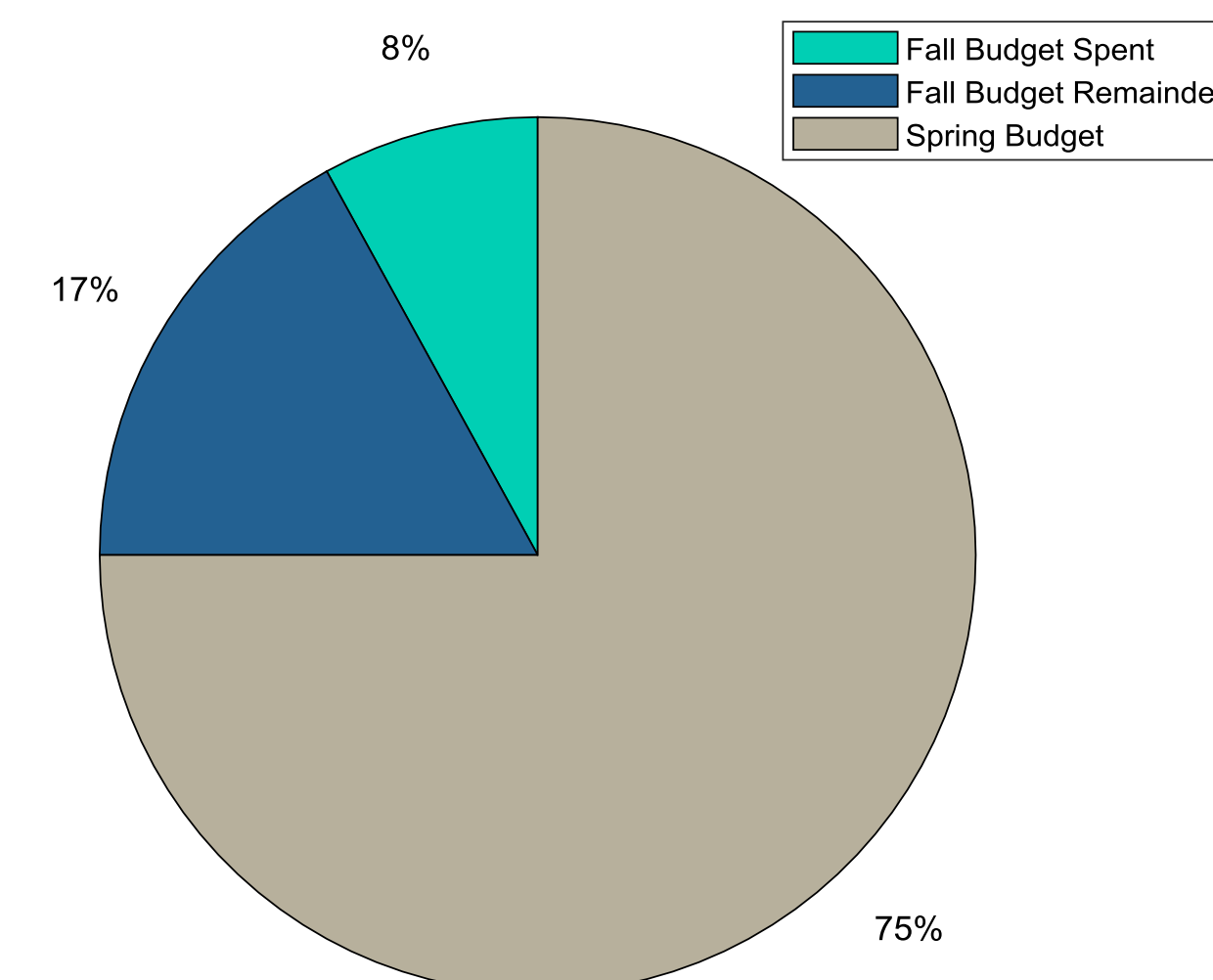
Playing Field



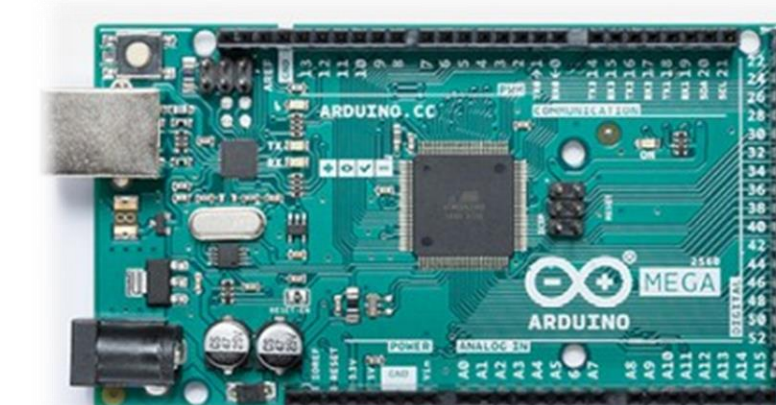
Overall Design



Budget

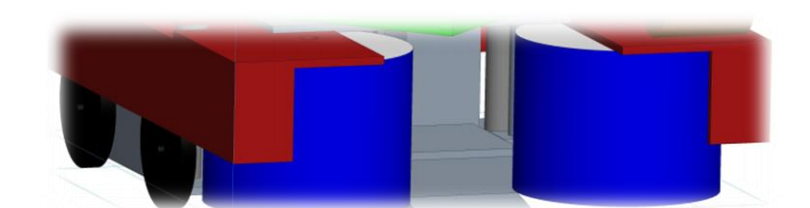


Concept Selection

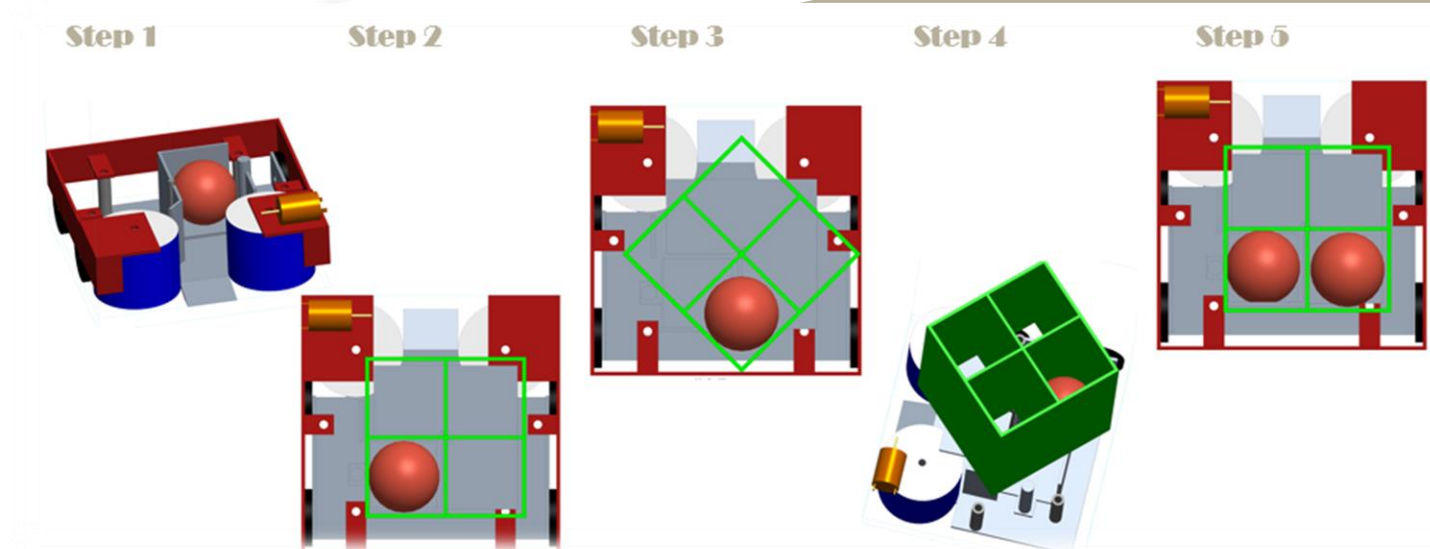


Arduino Mega

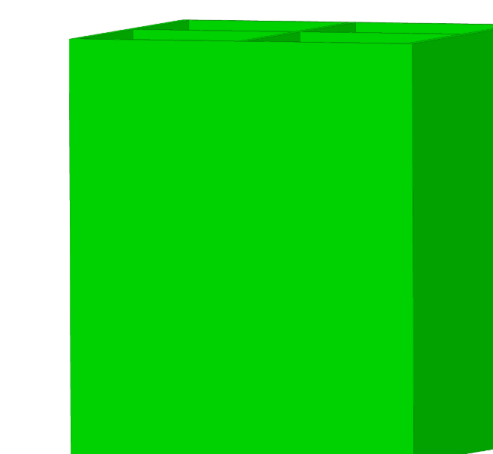
Gathering Solution



Sorting Solution



Storage Solution



Pixy 2



Future Plans

- Move to the final model of the robot, this includes:
 - Multiple modular components to meet the challenge of the other robots
 - Meet the targets that were laid out during the 2018 Fall Planning Section
 - Move to more lightweight design, compared to test material.