

### Abstract

This project consists of the design, build, and competition of a combat robot that will compete with other robots from universities around the nation. The tournament will be a double elimination bracket. The key components were the body, weapon, and drivetrain.

### Customer Needs and Requirements

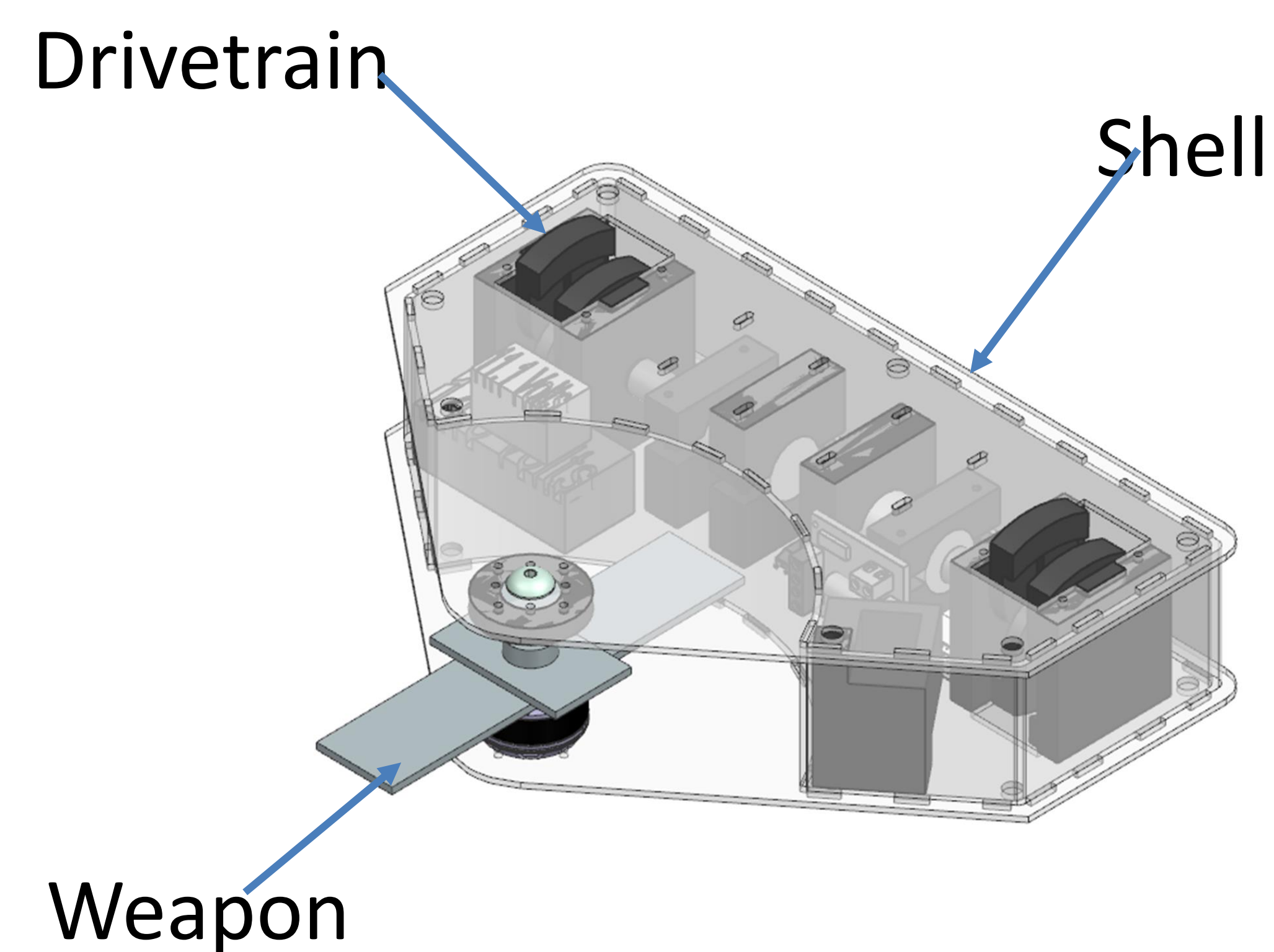
- Max size: 14" x 14" x 14" space
- Max Weight 4.5lb (for shuffle locomotion)
- Various safety requirements
- Target Speed – 5 ft/s
- Placement – Top 20%

### Concept Selection



	Body	Weapon	Drivetrain
Style	Tombstone	Lawnmower Blade	Shuffling
Material	Polycarbonate	D2 Tool Steel	PLA

### Design Solution



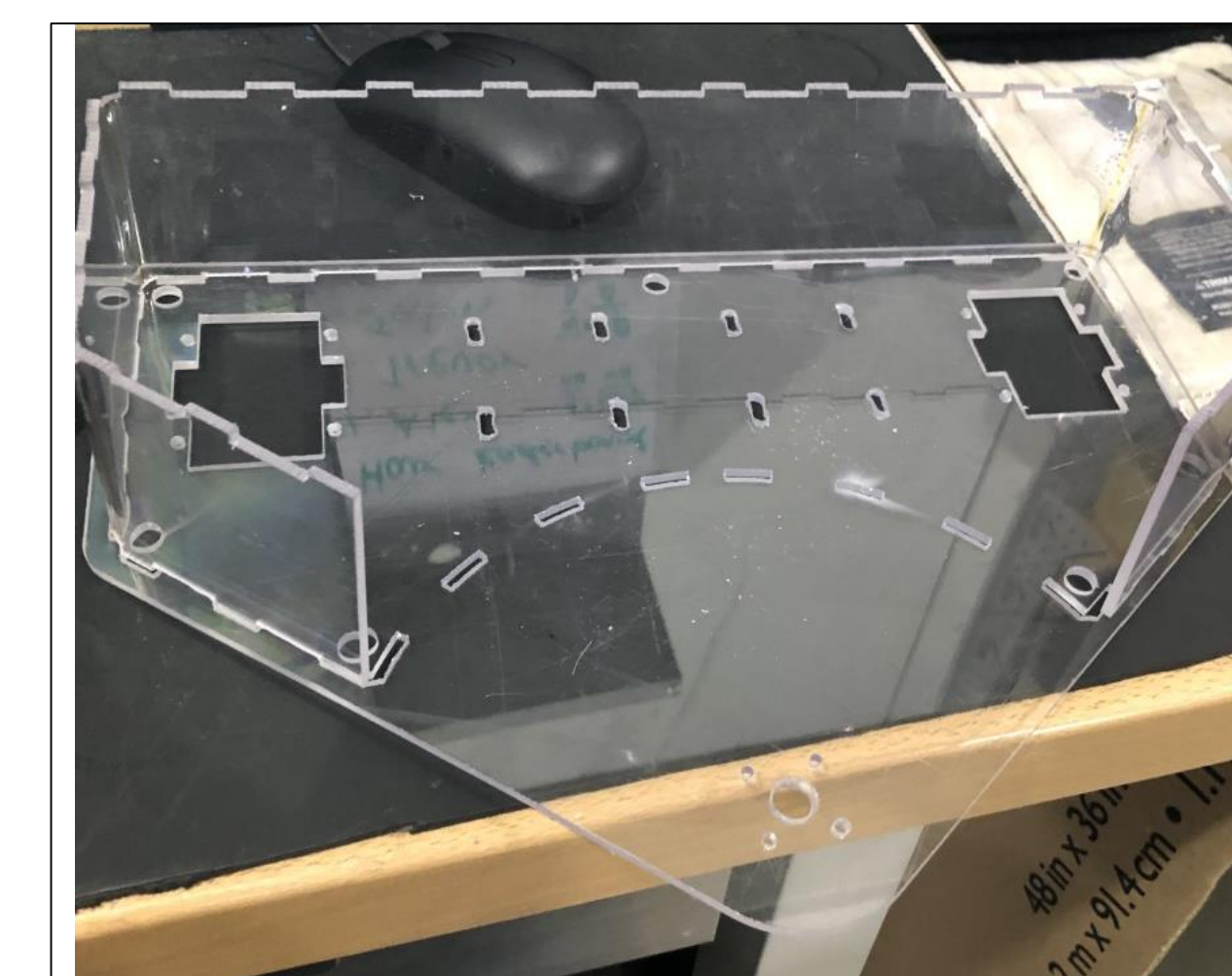
### Manufacturing

#### Weapon



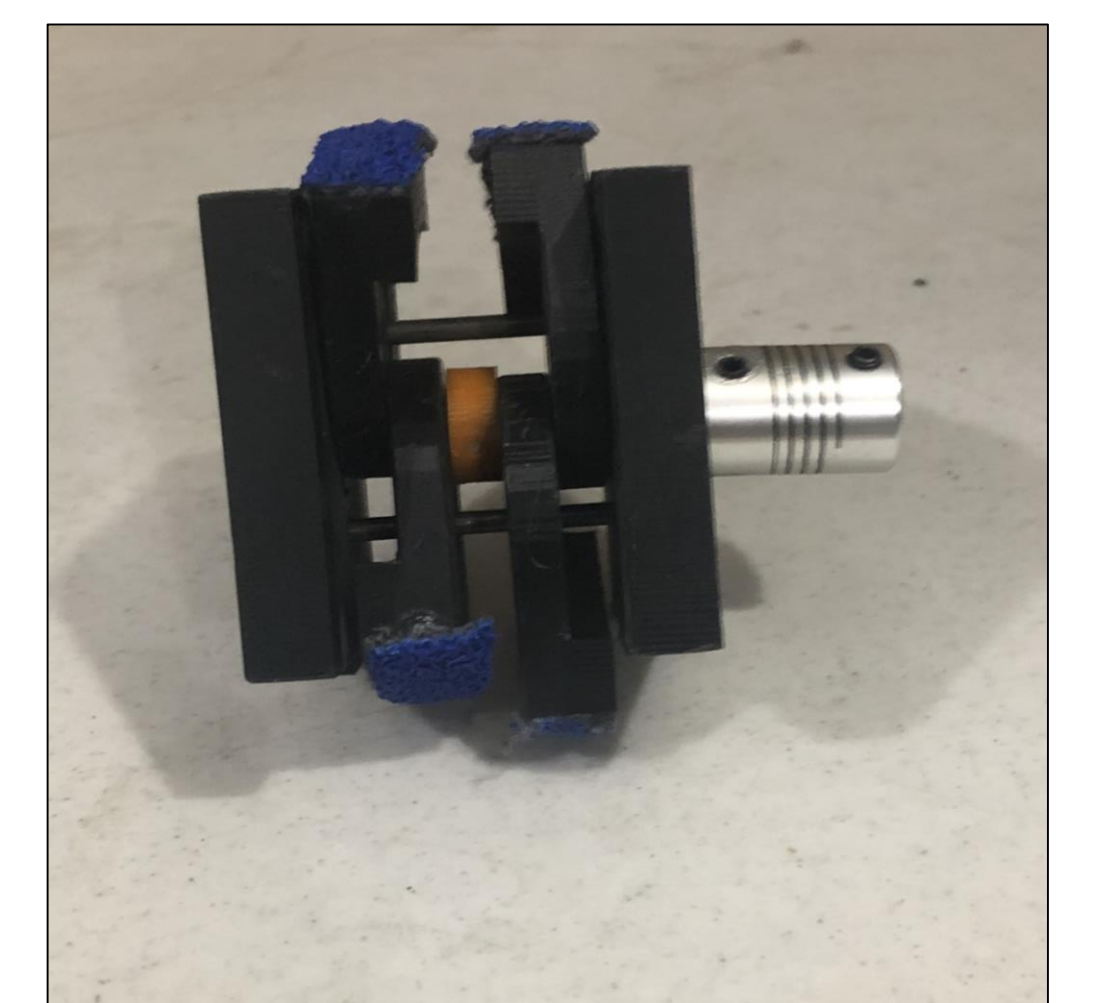
- D2 Tool Steel
- Used mill for holes
- Heat Treated

#### Shell



- Polycarbonate Shell
- Cut using Waterjet

#### Drivetrain



- Shuffle Mechanism
- 3D printed

### Testing/Validation and Results



The Final Robot

#### Weapon



- 20 sec spin down
- Hardness Testing
- Impact Testing

#### Shell



- Drop Test
- Height
  - Tosses

#### Drivetrain



- 6in/s
- Different traction materials

#### Results:

- 4<sup>th</sup>
- Innovation award



### Acknowledgments

Thank you to our sponsors, whose contributions were crucial to our success:

- Austin Ayers
- Angela Calhoun
- Nathan Calhoun
- Jessica Cokenour
- Dave Everett
- Karen Gardner
- Kevin Gardner
- Jerry Good
- Patty Good
- Sibylle Hernandez
- Beth Johnson
- Betty Johnson
- Chrisy Leistner
- Keith Leistner
- Paula Miller
- Lucason Nguyen
- Nathan Oliver
- Shanna Oliver
- Gary Reeves
- Caleb VanMeter
- Hannah VanMeter

