Octagonal-Shape Sumobot

- The sloped pyramidal shape of the robot makes it hard to attack by diverting force upwards. The slanted corners reduce the area that can be effectively attacked.

- If an enemy contacts one of the corners, the angle means the robots will slide past each other, allowing the defending robot to turn around and try to attack again.

Prototyping Process

- Our team was fortunate to have robots from previous years of competition to draw inspiration from.

- Drawing from those and examples of bots used in real life competition, we were able to narrow down the range of viable designs greatly

- The team uses 3D printing for prototyping, utilizing PLA as the primary material for the robot chassis and base plate.
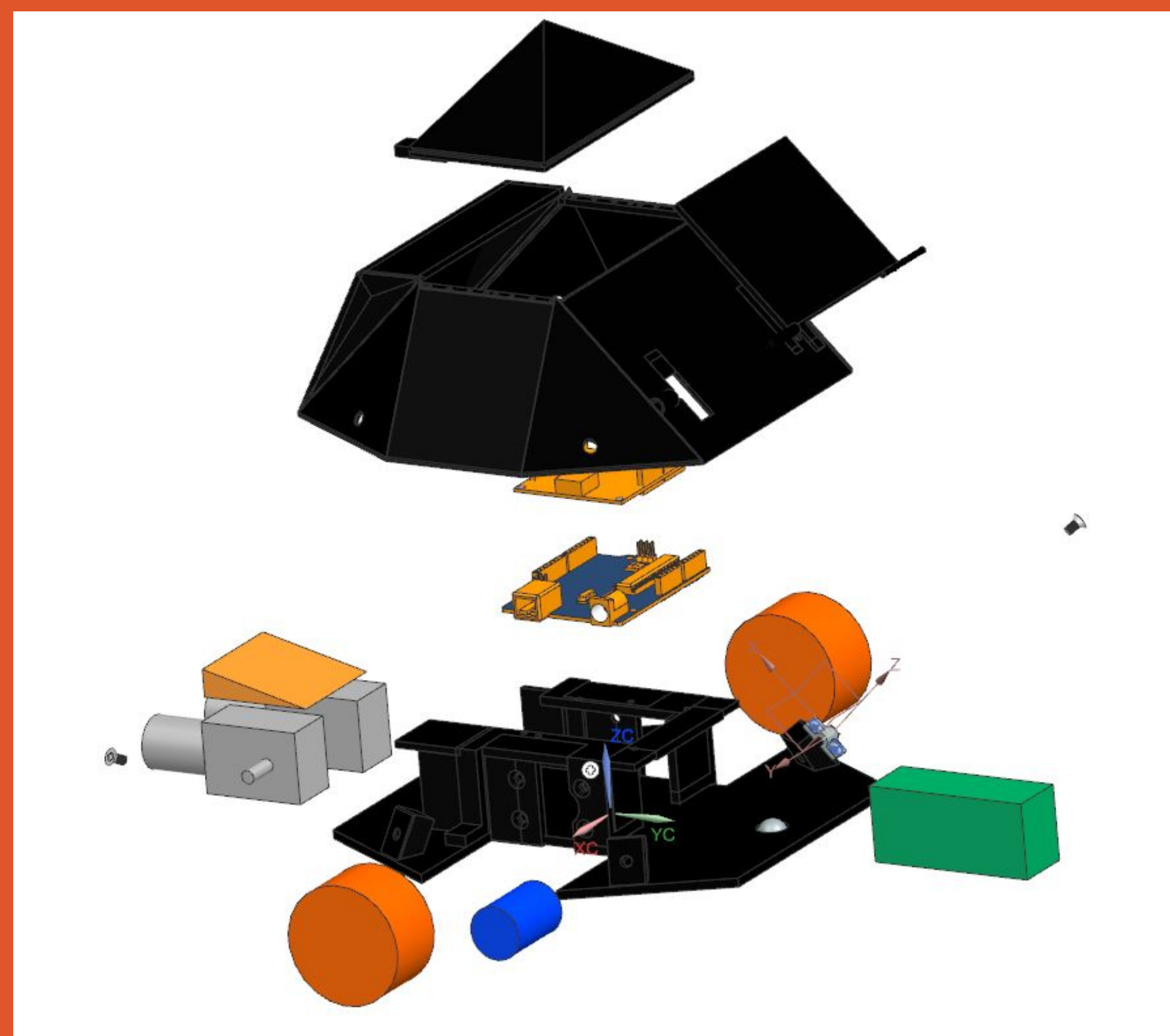
Figure 3. Exploded view of final sumobot design.

SUMOBOT, TEAM A

The Competition

Sumobot is a fast-paced competition where, like normal sumo wrestling, the objective is to push the opponent outside of a circular ring. Unlike other robot fighting competitions like Battlebots, restrictive rules are given for the construction of the robot. Most importantly, weapons are not allowed. Winning is based solely on torque, leverage, and driver skill.

The competition here at the expo is in the Mega-Sumo class, with a 3 kilogram weight limit and a 20 centimeter by 20 centimeter size limit. In addition, the OSU school of MIME requested that each team produce a robot with a unique shape, and some kind of actuated mechanism to help it fight.

Figure 1. Final sumobot design

The Rules

- The competition is a best of three, with a total time limit of three minutes. Teams have to act and fight fast to get all three bouts in under the time limit.

- In this version of sumo, tipping over does not result in disqualification. Robots can continue fighting even from their backs!

- To encourage dynamic fights, two robots being entangled with no progress on either side is a draw.

- Good sportsmanship is enforced, and teams that cajole and insult may forfeit points or the whole match.

Group Members
Jack Arts
Garret Goad
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Deployable ramps

- **Offensive Mechanism:** The ramp on the sumobot is designed to flip outwards, extending the bot's reach without exceeding the size limit

- **Tactical Elevation:** The ramp is used to lift and tilt the adversary's robot, unbalancing it momentarily. The robot can then torque the enemy upward.

- **Pushing Out Opponents:** By pushing the opponent upwards, the sumobot can reduce their traction, making them easier to ring out.

Robot Internals

- Our sumobot is using two 1.7 kgf.cm DC worm gear motors to drive opponents out of the ring.
- At the heart of the sumobot is the Arduino Uno R3. To control the robot with a PS4 controller we are using a USB host shield and a bluetooth USB dongle.
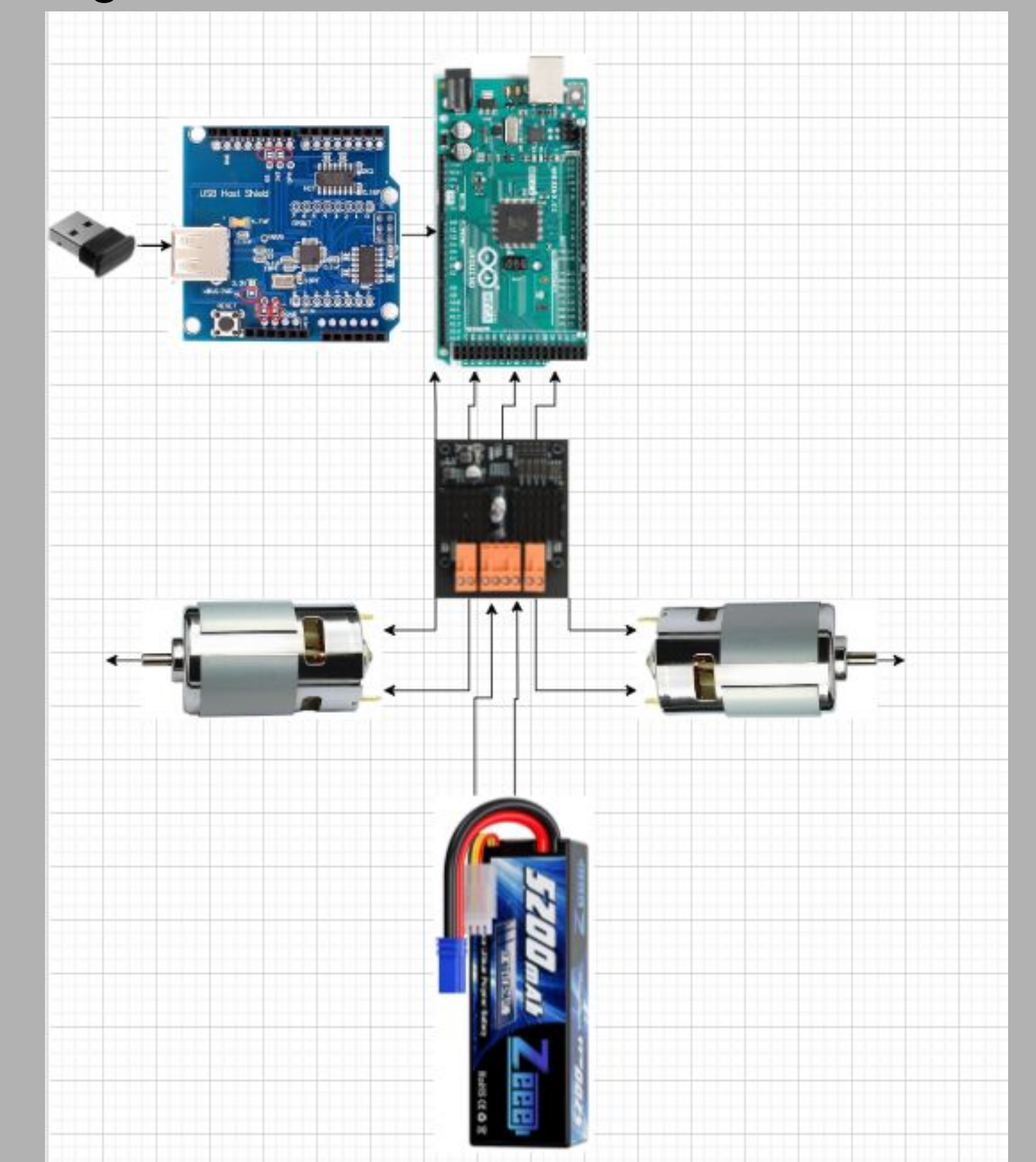- The JSumo silicone wheels generate high traction

Figure 2. The electronics of the bot center around an Arduino UNO, a USB host shield, and a motor controller