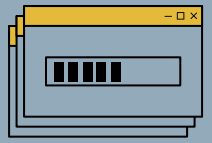
ME366J

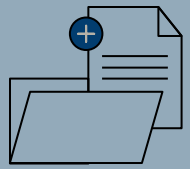


BATTLEBOTS DESIGN

Team 1!

Alex Carlson, Chuck Madueke, Kareena Patel,
Javier Ramirez, Abhi Vedire, Elaine Williams

TA: Chris Hong



19410

ME366J

19410

DESIGN PROCESS

RESEARCH

Interviews

Customer Needs Analysis

House of Quality

Online Resources

GOALS

- **Cause substantial damage**
- Outlast its competitors
- **Exceptional mobility**
- Achieve high speeds and also retain operability if flipped over
- Electronic and control systems are **reliable but also intuitive,** allowing drivers to adapt in dynamic situations
- **Safety system** with discernible hard stops and a kill switch for the electronics

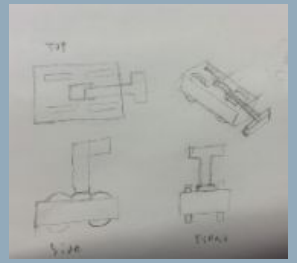
IDEATION

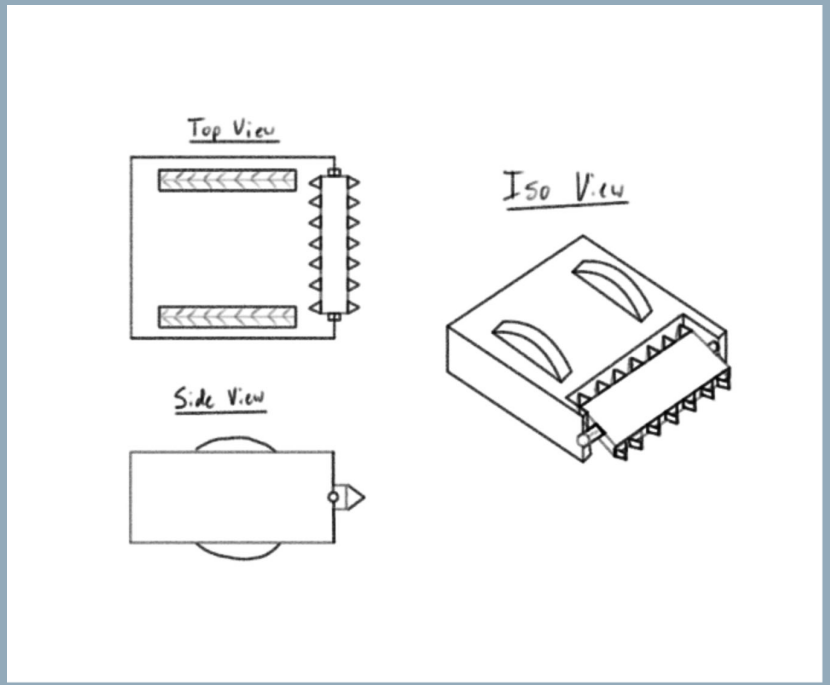
Morph. Matrix

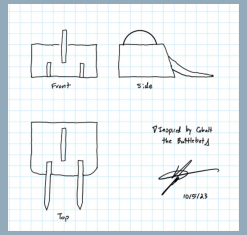
Pugh Chart

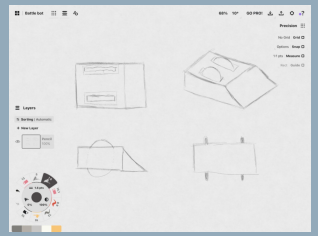
ME366J

LEADING CONCEPT



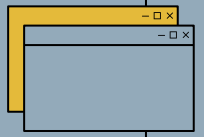






19410

DESIGN CHOICES & REASONING

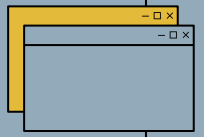


Component	Design Choice	Reasoning
Weapon	Spinning weapon	Easy to keep constantly spinning, easier to control and do not need to take time recharging
	Aluminum	Easy to machine (mill)
	Steel screws on perimeter of weapon for strength & durability	Impact zone now on the opposing robot Steel less likely to deform / can be replaced Screws increases moment of inertia → increased total rotational kinetic energy of weapon, providing 'bite' and can grab/flip opponents
	Use pulleys to change torque	Gears = direct impact = backlash = breaks teeth Instead, pulleys slips and absorbs any backlash

DESIGN CHOICES & REASONING

Component	Design Choice	Reasoning
Drive Train	Directly mounted	Saves space No gears
	Foam wheels	Wheels absorb impact instead of bouncing Lightweight → more weight into structural chassis Wheels are inside exterior frame in order to protect the wheels
	Drive motor into shaft	Outside axle connects to exterior chassis → wheels are supported by motor, axle is supported by outside bearing

DESIGN CHOICES & REASONING

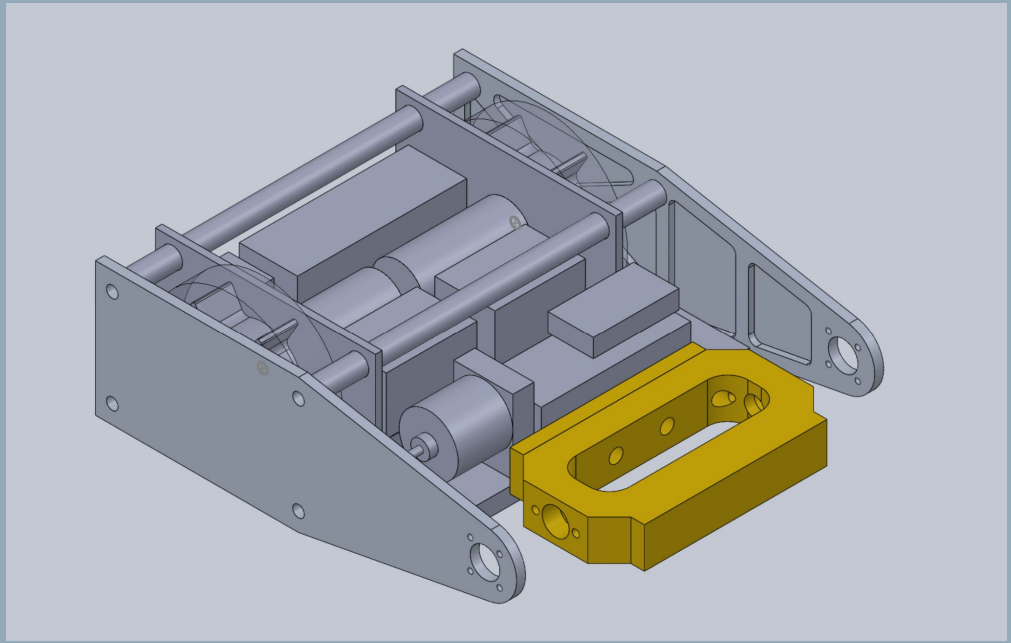


Component	Design Choice	Reasoning
Electronics	Lithium battery	Lightweight
	Brushless motor for weapon	More powerful, more speed
	2 brushed motors for drivetrain	Lower RPM
Chassis	CNC Aluminum side pieces	2 profile is easier to machine, no contours or 3D curves
	Standoffs	Rigid frame

ME366J

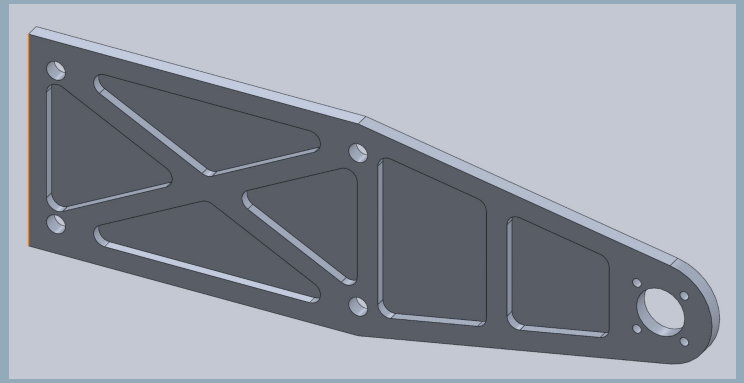
19410

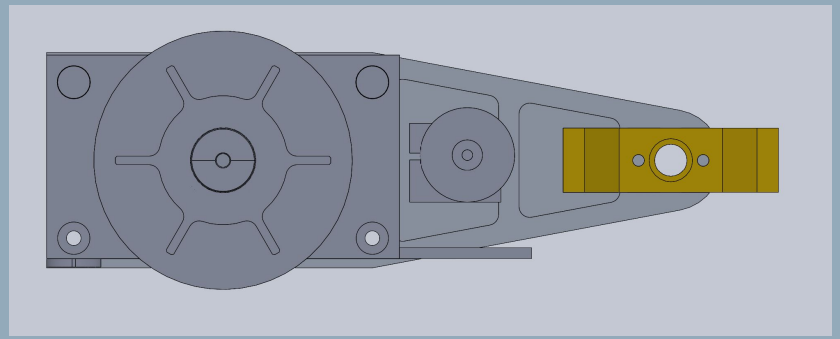
FINAL PROTOTYPE

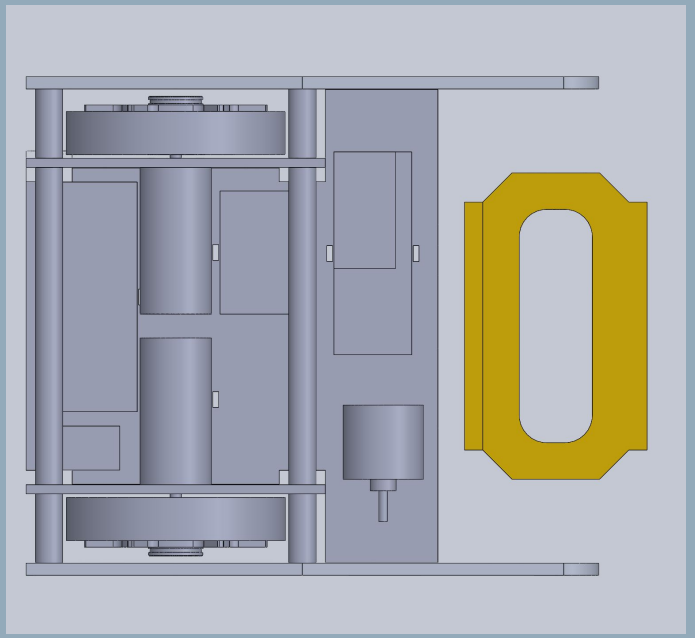


ME366J

FINAL PROTOTYPE







19410

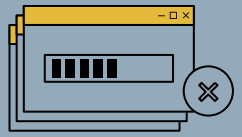
Most interesting aspect: CNC Side Plates

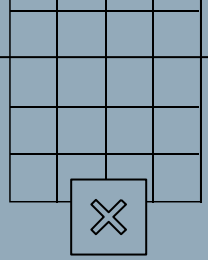
Started with 6061 aluminum 9"x4"x0.25"

1. Faced down to 4.25mm thickness to save weight
2. Added holes for critical mounting points
3. Cleared pockets to reduce weight while maintaining structural integrity
4. Cut out outer geometry

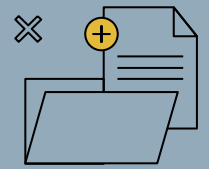
2.7 oz final weight per side

ME366J





THANK YOU



19410