

NMT ROBOT COMBAT ARENA

BACKGROUND AND OBJECTIVE

The goal of this project was to build a robot combat arena for New Mexico Tech to use for on-campus events that adheres to four aspects and meets the SPARC rules set by Dallas Area Robot Combat (DARC). The four aspects include portability, durability, modularity, and cost efficiency.

SPECIFICATIONS

Frame

- 8' x 8' x 8' pallet rack on castors
- Arena height is 4' from the ground
- 2' viewing area

Floor

- Four 2' x 8' wood sections
- Sections composed of 2" x 4" wood grid covered by 1/2" thick waferboard with 12 gauge steel sheeting on top
- Angle iron bumpers placed on two opposing sides

Ceiling

- Two 4' x 8' plywood boards, 1/2" thick with cut in air vents

Windows/ Doors

- Four 2' x 8' polycarbonate sheets suspended by 2 industrial hinges with 2 latches on the bottom each

Electronics

- White LED strips on the ceiling
- LED timer display suspended from ceiling
- One button for referee to start/reset timer

PROGRESS

- ✓ Attached steel sheets to wooden floor section with liquid nails
- ✓ Cut ventilation into ceiling
- ✓ Attached LED lights to ceiling
- ✓ Cut polycarbonate for windows/doors
- ✓ Attached hinges and latches to frame
- ✓ Attached angle iron to floor
- ✓ Painted arena frame
- ✓ Completed button and timer display

CONSTRUCTION

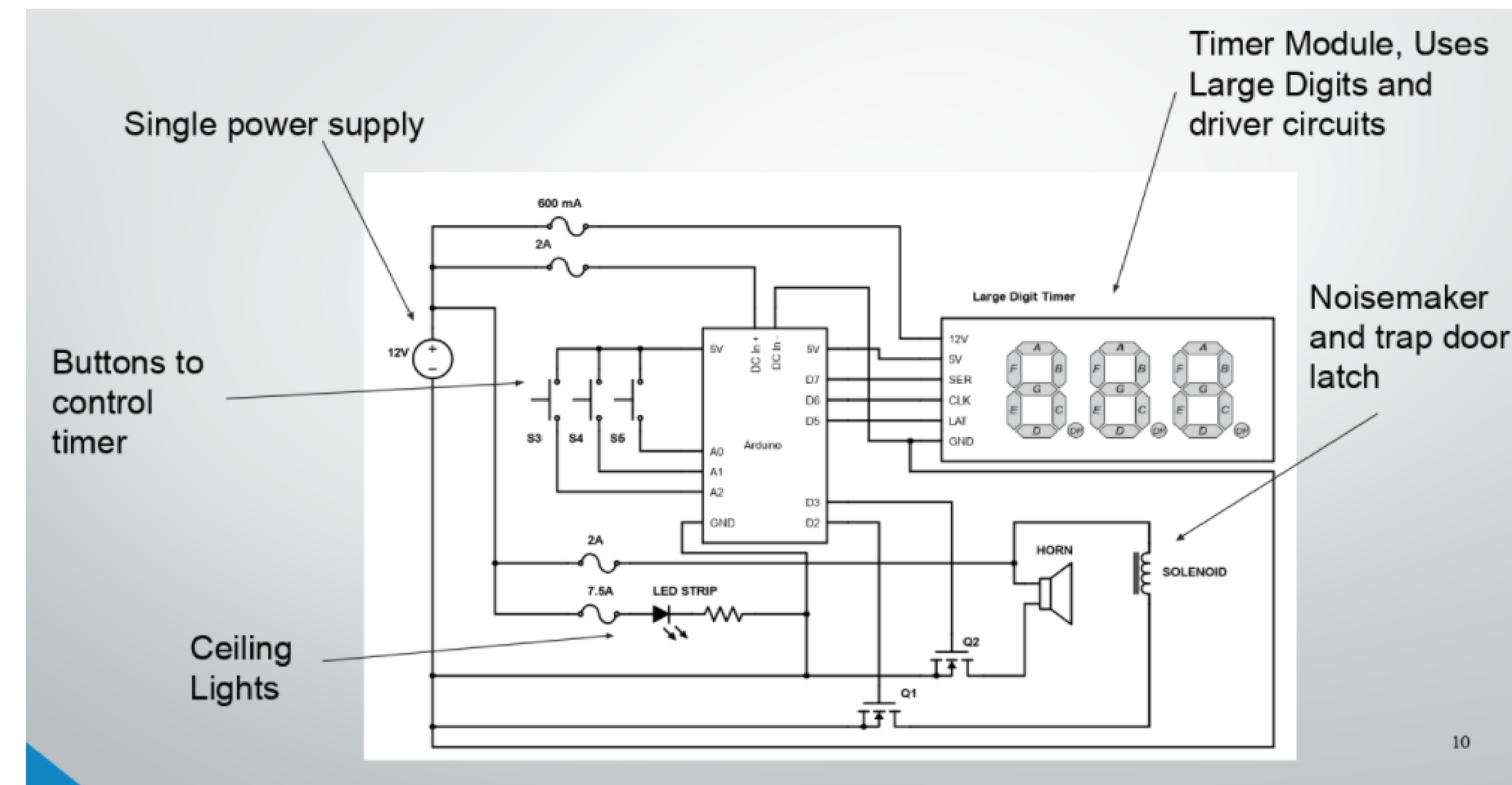


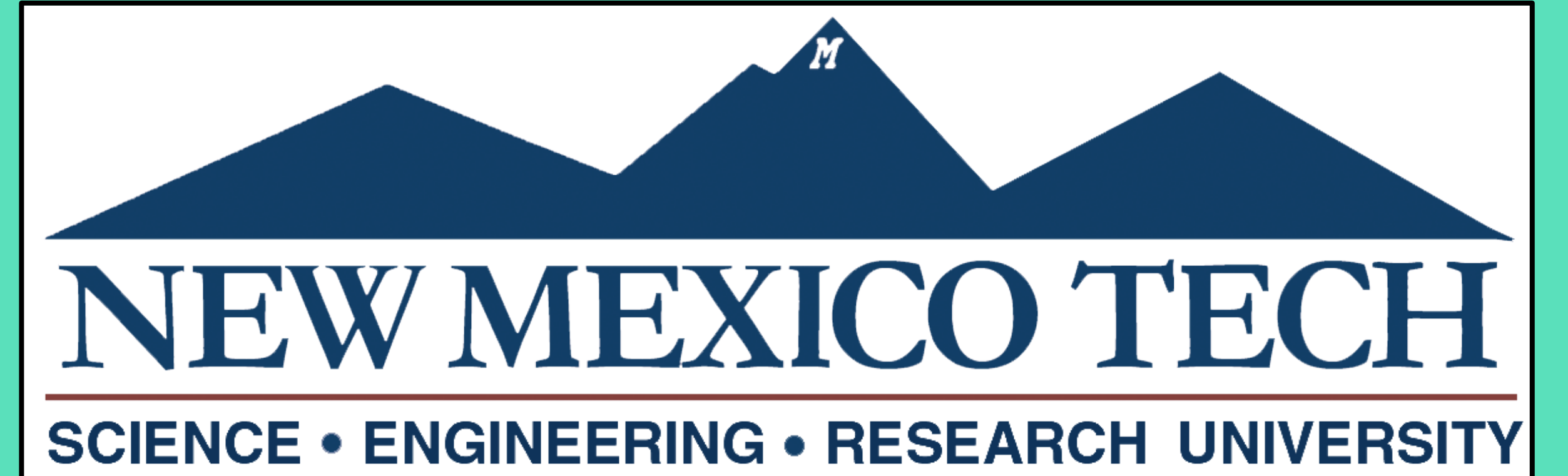
Figure 1. Electronics wiring layout



Figure 2. Completed arena

FUTURE IMPROVEMENTS

Repair warped floor
Setup timer and electronics
Add 3D printed timer case
Add 3/4" x 3/4" aluminum angle to windows
Add obstacles



TESTING

Assembly/Disassembly

- Approximately 1 hour to assemble and 1 hour to disassemble
- 3 people recommended

Efficiency

- Warped floor prevents smooth movement for robot with weapons located near the floor

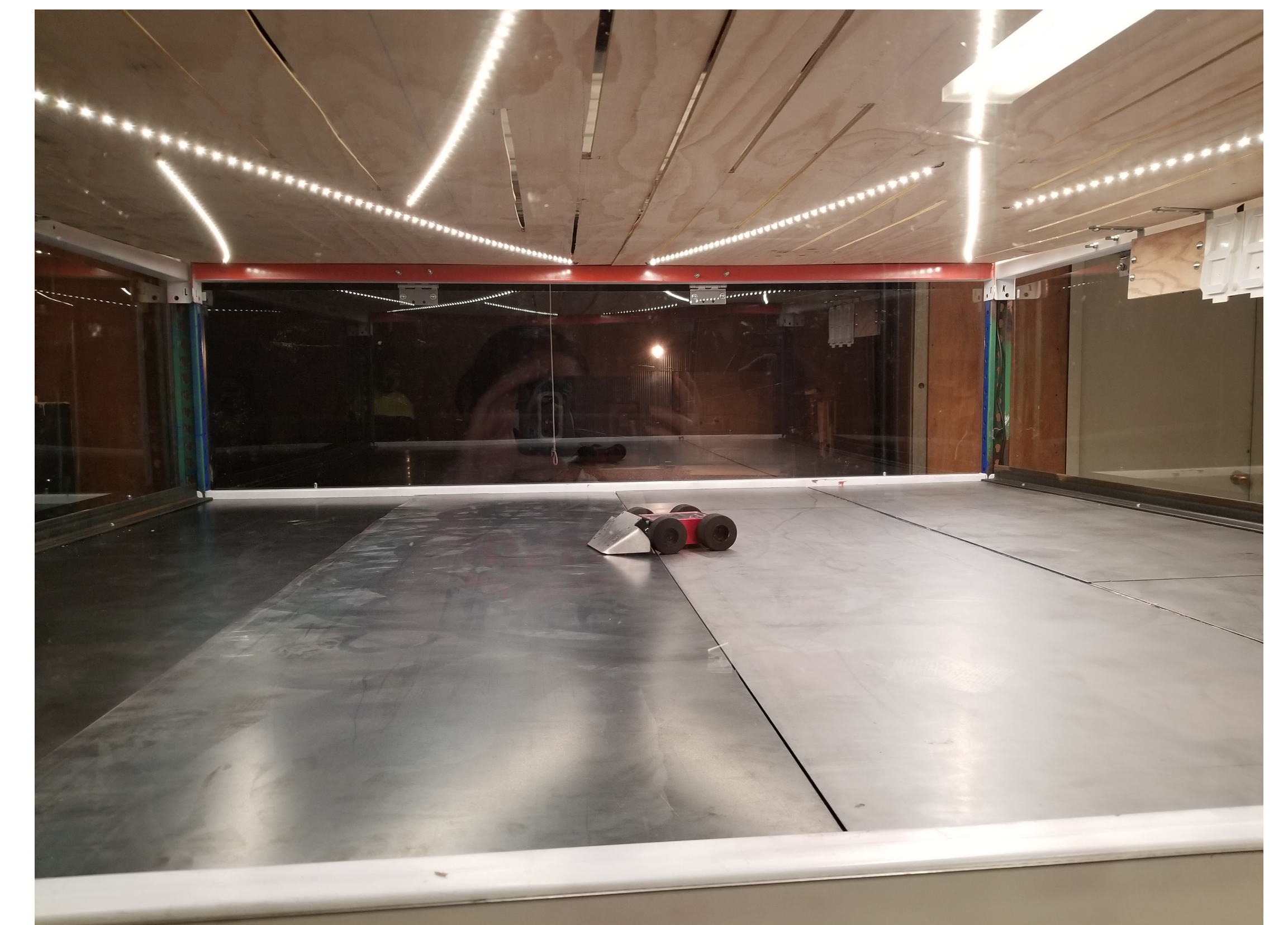


Figure 3. Robot testing



Figure 4. Robot crashing into window

FALL 2020 TEAM

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