

# **Control Award Submission Form**



\*\*Please turn in this sheet during your judge interview along with your engineering portfolio\*\*

Team # 8696 Team Name: Trobotix

### **Autonomous objectives:**

- Read the team prop's position and place the purple pixel on the correct spike mark.
- Navigate to score a pixel on the corresponding backdrop.
- Park backstage.

### Sensors used:

Logitech Webcam Streams images to our custom pipeline that detects prop placement.

Odometry Pods x3 For accurate robot localization during autonomous.

Slide Encoder (built-in) Prevents the linear slide from exceeding it's maximum length or unspooling.

# **Key algorithms:**

- Gaussian blur combined with HSV color masks and contour detection to locate objects in images.
- Three dead wheel localization algorithm that accounts for heading / turning drift using a process known as the "pose exponential".
- PIDF controllers, one per driving, strafing, and turning.

### **Driver controlled enhancements:**

- Toggleable drive between field-centric and robot-centric.
- Improved controller sensitivity by squaring the raw value, attaining a linear rate-of-change.
- Toggleable reduced speed mode, for when finer drive movements are desired.

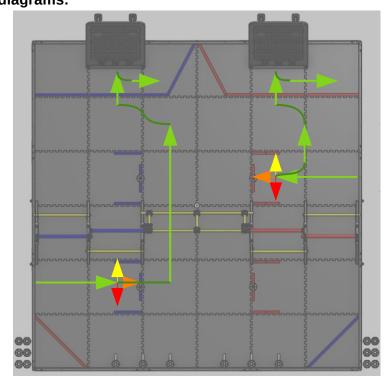
#### **Driver interfaces:**

- Driver configurable autonomous.
- Autonomous scripting.

Intuitive telemetry-based UI for configuring autonomous parameters. A custom scripting language for programming autonomous routes. More intuitive and has a simpler syntax compared to Java.

## **Engineering portfolio references:**

Design § 3.7.b Sensors
Programming § 4.1 TeleOp
Programming § 4.2 Autonomous
Autonomous program diagrams:



Revision 1: 9/9/2023