Control Award Submission Form

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

Team # 5661	Team Name: Wolves Robotics 1

Autonomous objectives:
Positioning and orientating to identify the team prop through pre-defined spline paths. Following identification, positioning to place the purple pixel on the corresponding spike mark. Afterwards, following a pre-defined path to the corresponding backdrop section to place the golden pixel. Finally, parking off to the side of the board to give room for alliance member.

Sensors used:
The sensors equipped on our bot include the Modern Robotics Range Sensor, Logitech C920 Webcam, 2 GoBilda Odometry Pods, and the Rev Hub Internal IMU. The main purpose of the MR Range Sensor is to identify the team prop. The Logitech C920 Webcam is used to identify backdrop april tags. Lastly, both odometry pods and the IMU are used for localization and path following in autonomous.

Key algorithms:
Thresholding the distance obtained from the MR Range Sensor to determine the location of team prop. PID algorithm for controlling robot heading, path correction, and path following. Box collision detection by separate axis theorem for collision avoidance with backdrop. AprilTag detection for correcting robot localization in autonomous due to dead wheel inconsistencies.

Driver controlled enhancements:
Automatic robot orientation and automated retraction of linear slides when placing pixels on the backdrop for rapid placement. Collision avoidance with backdrop to avoid knocking pixels off. Different driving modes: "Driving" and "Placing," for more intuitive robot control and autonomous management of the linear slides and the claw.

Engineering portfolio references:
In the engineering portfolio, references are located under Software Processes where Autonomous and TeleOp are described more. Under the Autonomous section it describes the many options to choose from when detecting the prop are what the benefits of each are. We found that using a combination between distance sensors and possibly Tensorflow (in the future) would give the most accurate detection. In the Engineering Process section, it's also described how we had to control the robot arm given the design

Autonomous program diagrams: