



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

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| Name(s) Jake Grigorian | Project Number J0313 |
| Project Title Which Robotic Apparatus Toggles a Flag the Most Efficiently? | |
| <p style="text-align: center;">Abstract</p> <p>Objectives The objective of my project was to determine which of the three robotic apparatuses that I designed, built and programmed would perform the best in accuracy and speed in launching a ball at a plastic flag and toggling it. I hypothesize, that the Plate-Punt Slingshot apparatus will perform the best in toggling the flag.</p> <p>Methods Body of VEX Robot, materials for three different robotic apparatuses (Plate-Punt Slingshot, L-Shaped Slingshot, High Friction Flywheel), yellow VEX ball, plastic VEX flag, joystick, competition field (area of testing). I coded the program for joystick and robot function and used my stopwatch. Designed, built and programmed the three apparatuses. Respectively attached each robotic apparatus to the body and had it load and fire the ball at the plastic flag. Tested each apparatus ten times and averaged the results.</p> <p>Results After ten trials for each robotic apparatus, I averaged the results. I determined that the Plate-Punt Slingshot had the fastest average speed, 3.11 seconds and highest accuracy, 100%, of the three apparatuses in toggling the flag with the ball. This meant that it was the most efficient at performing the task at hand as compared to the other apparatuses (L-Shaped Slingshot 3.3 average seconds, 80% accuracy, and the High Friction Flywheel 3.592 average seconds, 90% accuracy).</p> <p>Conclusions I designed and built three robotic apparatuses, which are the Plate-Punt Slingshot, L-Shaped Slingshot, and High Friction Flywheel, and attached each individually to the body of the robot and programmed and commanded it to load and fire the ball at the flag. After determining that the Plate-Punt Slingshot was the most effective apparatus, it can be concluded that it is the most efficient apparatus out of the three.</p> | |
| Summary Statement I designed a robotic apparatus, currently being used in robotics competitions, that is the fastest and most efficient in its category. | |
| Help Received I designed, built, and programmed, the robot and its apparatuses, and also performed the trials by myself. St. Francis High School provided the materials and field to perform my trials. | |