CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Jake P. Grigorian

Project Number
38537

Project Title
Which Robotic Apparatus Picks Up a Cone the Fastest?

Abstract

Objectives/Goals
The objective of my experiment is to find out which of the three robotic apparatuses most efficiently picks up cone and places it on a mobile goal. These three apparatuses are a metal claw, a rubber band intake, and a rubber band with mesh intake. The effectiveness of each apparatus will be measured in time(seconds), materials and weight (metal, rubber band, rubber mesh). I hypothesize that the rubber band with mesh intake would perform the best because of the fact that it has a gripping mesh wrapped around its circumference, and it is also lighter than the metal claw.

Methods/Materials
Body of VEX Robot, materials for three different robotic apparatuses(metal claw, rubber band intake, rubber band intake with mesh), yellow VEX cone, mobile goal, joystick, competition field(area in which robot will be tested). The materials provided by St. Francis High School Robotics Department.
I coded the program for joystick and robot function and used my stopwatch.
Designed and built the three apparatuses. Respectively attached each robotic apparatus to the body and had it pick up a cone and place it on the mobile goal. Tested each apparatus ten times and averaged the results.

Results
After ten trials for each robotic apparatus, I averaged the results. I determined that the rubber band intake, having the lowest weight of the materials also had the fastest average time, 1.612 seconds, in picking up the yellow cone and placing it on the mobile goal, meaning that it was the most effective at performing the task at hand as compared to the other apparatuses(metal claw 2.257 seconds, rubber band intake with mesh 1.724 seconds).

Conclusions/Discussion
I designed and built three robotic apparatuses, which are the metal claw, rubber band intake, rubber band intake with mesh, and attached each individually to the body of the robot and programmed and commanded it to pick up the cone. After determining that the rubber band intake was the most effective apparatus, it can be concluded that it should be used during robotics competitions.

Summary Statement
I designed a robotic apparatus, currently used in robotics competitions, that is the fastest and most efficient in its category.

Help Received
I designed, constructed, and programmed all the apparatuses, and performed the trials. Due to the weight and size of the robot's body, I along with the St. Francis High School Robotics Team, built the body.