| Name(s) | Project Number |
|---|---|
| **Renden E. Yoder** | **S0331** |

**Project Title**

## Replicating Biological Walking Patterns in Robotic Systems

### Abstract

**Objectives/Goals**
The main goal of my project is to recreate quadruped walking motions seen in certain species into a self-built robotic system. In addition to this, the aim was to also integrate a level of autonomy into the robot and program a turning sequence to allow the robot to avoid collisions with any object in front of it.

**Methods/Materials**
To achieve this I built a four legged robot using aluminum sheet metal, acrylic glass panes, servo motors, an arduino, and an assortment of nuts and bolts purchased from my local hardware store. I cut out desired shapes from the aluminum and the acrylic and then shaped them using a dremel. I then programmed the robot to walk, using an arduino microcontroller, with the same biological footfall pattern as a pray mantis, otherwise known as a canter.

**Results**
I successfully replicated the biological walking pattern of the pray mantis by evaluating and diagramming its walk. I was able to program a walking sequence to control the servos in such a way that the robot was able to efficiently walk in a manner that resembled a canter walking pattern.

**Conclusions/Discussion**
After multiple attempts to write a code for the walking sequence, I eventually created one which I was satisfied with. Despite minor setbacks and a few stripped gears, I successfully created a walking pattern which mimicked biological quadrupedal walking motions. For future research and experimentation, I would like to create a hexipod robot and create a walking sequence to mimic six legged species to further my investigation of different animal and insect walking patterns

**Summary Statement**

Mimicking four legged animal walking patterns in a robot.

**Help Received**

Father aided me in using power tools