EE/CPRE/SE 492

Weekly Report 10

Goose Chaperone
SDDEC19 - 17
09/02/2019 - 09/13/2019

Client/Advisor:
Randall Geiger

Team Members:
Weston Berg
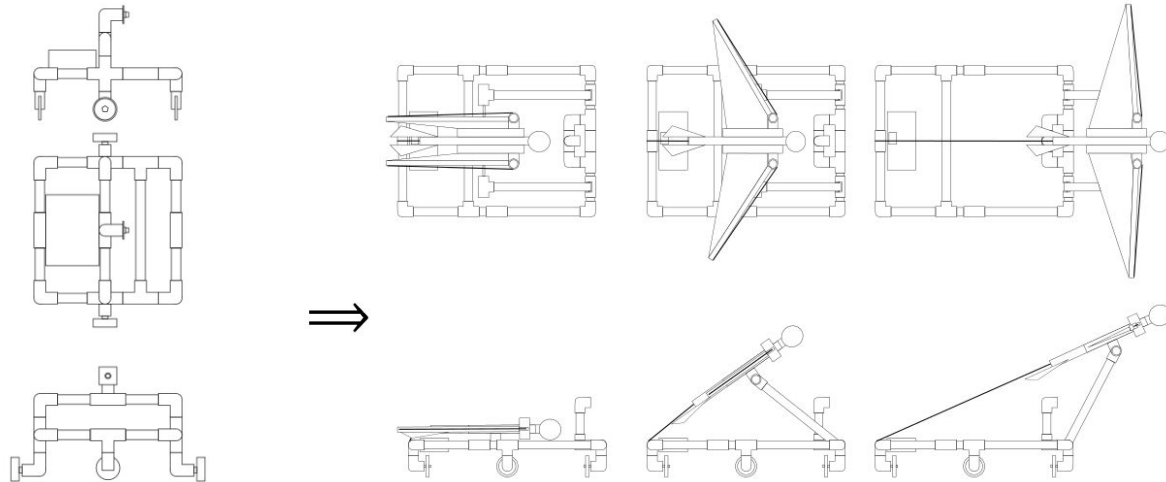Zhihao Cao
Alec Morris
Johnson Phan
Woodrow Scott

Past Weeks Summary

The main objective for the team was synchronizing what tasks each member was going to work on for the remainder of the semester and continuing work in those tasks. The initial prototyping code for controlling the system's DC code was completed. Several documents were created for showing how the system's components interface. Another objective was preparing the team's presentation for the first of two PIRMs. The PIRM presentation was completed and delivered to the class on 09/12/2019.

Past Weeks Accomplishments

- DC Motor Control - Weston
    - Began development of the DC motor driver for controlling the robot's two DC motors
    - Researched dual DC motor controller boards. These boards have dual H-bridges for allowing the ability to reverse the DC motor direction
        - Landed on TI's DRV8835
    - Motor control will loosely follow the following diagram

Source: https://a.pololu-files.com/picture/0J4058.600.png?9eff351b63a93064f7eaeb6b781449d6

- Misc - Weston Berg
  - Constructed project's Git repository structure for source code and documentation
  - Designed system diagrams illustrating how the various peripheral components interface with the Beaglebone Black microcontroller
- Adafruit GPS Module - Alec Morris
  - Began working on a tutorial for integrating our GPS module with the microcontroller
  - Didn't have access to the board, so could only make psuedocode at the moment.
- Tensorflow Model and Training Sets
  - Created program using Google Custom Search authentication to scrape internet for images of geese
  - Program includes CLI options for image resizing, keywords (for including classifications sets other than geese that may be needed)
  - Program separates each downloaded and processed image for future work
  - Increased sample resolution for 32x32 to 256x256. Error rates should be significantly lower
- Re-design and refine PVC model - Johnson Phan
  - Reconfigure then add eagle imitation with the camera module shifting to the front for the new design model.

Pending Issues
N/A

Individual Contributions

Team Member	Hours (Report Duration)	Cumulative Hours
Weston Berg	20	53
Zhihao Cao	4	31
Alec Morris	4	32
Johnson Phan	5	35
Woodrow Scott	6	39

Plans For Upcoming Weeks
- Weston Berg
  - Construct prototyping chassis
  - Finish development of motor driver
  - Test and tune motor driver
  - Move on to development of another peripheral driver
- Alec Morris
  - Begin programming basic functions of GPS
  - Interface GPS module with Beaglebone
- Zhihao Cao
  - Test sensor basic function

- ○ Connect sensor to Beaglebone
- ● Johnson Phan
  - ○ Add additional slots for installing additional modules
  - ○ Confirm feasibility of new model and reconfigure to work properly
- ● Woodrow Scott
  - ○ Complete automated sample image program
  - ○ Create automated ML learning script and tests
  - ○ Test created models with camera for more accurate testing
  - ○ Iteratively train and enhance models
  - ○ Stitch processed images for faster Tensorflow sampling

Weekly Advisor Meeting Summary
N/A