

## *EE/CprE/SE 491 WEEKLY REPORT 9*

*4/21/26-4/28/26*

*Group number: sddec26-03*

*Project title: Squirrely Bird Feeders - Using AI to outsmart the Squirrels*

*Client &/Advisor: Randall Geiger*

### *Team Members:*

- Wyatt Sinclair
  - Jack Morrison
  - Miles Nichols
  - Kenny Tran
  - Benjamin Bartels
  - Nolan Hoenert
- 
- **Weekly Summary:** This week, the team successfully gathered real-world test images using the Raspberry Pi deployed at our advisor's house, enabling the squirrel classification model to achieve an impressive 99% confidence rating. To combat excessive data usage from sensor false positives. That generated 8GB of images in just a few days, the team is now shifting focus to run the recognition model locally on the Pi to filter out noise before transmitting data. Additionally, we finalized the main design document, made solid progress on the backend API and frontend Angular setup, and 3D-printed new components to assemble the feeder's gate.
  
  - **Past week's accomplishments**
    - Jack Morrison: Continued to design the backend API service using openapi decided to hold off on the VM request following discussions of performing image recognition on the PI for now.
    - Wyatt Sinclair: Got our test images from the Raspberry Pi. These images were from Prof Geigers backyard. I trained my model with them and got a 99% confidence rating on the pictures, which is very good.
    - Nolan Hoenert:
    - Benjamin Bartels: Got some testing in with the Raspberry Pi and image gathering. Got

the Raspberry Pi set up as a bird feeder watcher at our advisor's place.

- Kenny Tran: Broke the Angular installation while experimenting with Capacitor. Separate folders in gitlab project to separate different parts of the project.
- Miles Nichols: Completed the Design Document

○ **Pending issues:**

Wyatt Sinclair: N/A

Jack Morrison: N/A

Nolan Hoenert: N/A

Miles Nichols: N/A

Kenny Tran: Polish the Angular installation readme and commit to the repo. Need to handle different users with potentially multiple bird feeders and the receipt of images.

Benjamin Bartels: waiting for a servo part to arrive so we can assemble the gate and calibrate the positions.

Everyone: N/A

○ **Individual contributions:**

<b><u>NAME</u></b>	<b><u>Individual Contributions</u></b> <i>(Quick list of contributions. This should be short.)</i>	<b><u>Hours this week</u></b>	<b><u>HOURS cumulative</u></b>
Jack Morrison	Worked more on putting the API design into a formal format using OpenAPI.	6	60
Miles Nichols	Complete the final version of the design document		52
Wyatt Sinclair	Tested the classification model on the test images we took. Uploaded model to gitlab	11	56
Nolan Hoenert	Started block diagram iterations	6	58
Kenny Tran	Continued frontend work.	6	52
Ben Bartels	Sorted through the images from the birdfeeder for all the images of squirrels that fed at the feeding bowl. 3D printed and assembled the new set of the parts for the	11	87

	feeder's gate.		
--	----------------	--	--

- **Comments and extended discussion**

- [Squirrely Bird Feeder Design Sets - Google Docs](#)

- [Cloud Tech Stack](#)

- **Plans for the upcoming week** *(Please describe duties for the upcoming week for each member. What is(are) the task(s)? Who will contribute to it? Be as concise as possible.)*

- Jack Morrison: Finish API design and work with Ben to transfer Wyatt's recognition model onto the PI and integrate it into our existing motion algorithm.

- Miles Nichols: Help the team with the first draft of our project

- Kenny Tran: Help Jack figure out the birdfeeder to user relationship for the backend to deliver images to the correct person.

- Benjamin Bartels: Place the last parts order for the semester, so while we're testing over break, we can test on some new parts. Those parts can also serve as extra parts, in case something breaks during testing. If the parts come in, I will also be assembling and calibrating the servo that controls the feeder gate, as well as writing code for the pi to control the servo. And work with Jack to get the recognition code to work on the pi.

- Wyatt Sinclair - Work on slides and website. Try to implement our classification model on the Raspberry PI.

- Nolan Hoenert: Start working on the slides for the demo. Start working on the web app/mobile app.

- **Summary of weekly advisor meeting:**

In this week's meeting, we discussed recent progress and concerns for the squirrel classification model. It reached 99% confidence when detecting squirrels using the collected images. Talked about ways to reduce the field of view of the camera so that it would not take so many unnecessary images. WE used 8GB in 2 and a half days. We discussed running the model on the Raspberry Pi, and we are trying that out. Geiger raised concerns about the background appearing in images and suggested adding an algorithm to remove the background so the model can run faster.