Team 3 Bi-weekly Report : 06
March 24th - April 6th

Summary:

Object Detection:

We were able to complete the retraining of the model on combines and fences, allowing us to test it with real time video feeds. Due to the larger training set and greater number of epochs we trained the neural network for, our results on the real time video feed looked very positive.

Distance Measurement:

This work period we were able to finish implementing the distance measurement part of this project. Unfortunately, it is not quite as accurate as we had hoped at close range so we will try to change different variables to see how we can improve this. We also integrated the distance measurement system with the neural network so they can now both run in the same process.

Pending Issues

- One of the cameras is giving a purple video feed and one of the cables is broken as well
- Cameras are poorly documented
- SIFT object detection, and subsequently distance measurement, works far better with the original images than the undistorted ones
- Distance measurement gives relatively large variance at low distances

Plans for the Upcoming Work Period

- We plan to get another camera from SmartAg to fix our hardware issues
- Test the distance measurement at longer range and with a larger separation between the cameras
- Finish extracting the fieldsafe data set and use it to test the neural net

Individual Contributions

John:

- Team Role: Communications Lead
- Contribution:
    - Implemented undistortion in OpenCV using parameters obtained with MATLAB
    - Performed troubleshooting for broken cameras

- ○ Tested different equations for distance measurement
- ○ Set up environment to extract full Fieldsafe data set
- ○ Helped Souparni and Bowen to integrate the distance and object detection systems
- Hours Worked: 14
- Total Hours: 50.5

Souparni:
- Team Role: Meeting Facilitator
- Contribution:
  - ○ Worked with Bowen to get more images, set up the neural network and retrain the model to identify fences and combines
  - ○ Collaborated with Bowen to test the real time object detection with video feed.
  - ○ Modified distance code to integrate the distance and object detection code together.
- Hours Worked: 12
- Total Hours: 48

Fahmida:
- Team Role: Tester
- Contribution:
  - ○ Assisted Souparni and Bowen to integrate the distance and object detection code together.
  - ○ Troubleshooted issues with numpy arrays in calibration code and resolved them.
  - ○ Assisted in troubleshooting with respect to determining accuracy issues in the distance measurement code.
- Hours Worked: 8
- Total Hours: 39

Ashley:
- Team Role: Document Manager
- Contribution:
  - ○ Troubleshooted python code with fahmida
  - ○ Worked with the implementation team
- Hours: 10
- Total Hours: 46

Eric:
- Team Role: Webmaster
- Contribution:
  - ○ Worked to prepare for final presentations

- Hours: 7
- Total Hours worked: 46

Bowen:

- Team Role: Hardware Maintainer
- Contribution:
    - Worked with Souparni to train for two objects, fence and combines
    - Find the coordinates for bounding boxes
    - Combine object detection and distance measuring code
    - Hours worked: 10
- Total Hours: 35