Team Members/Role
Andrew Kicklighter - Mobile Developer
Alexander Weakland - Wildcard Developer
Nicholas Dykhuizen - Integration Developer
Justin Elsbernd - Integration Developer
Joshua Heiser - Embedded Developer
Paul Kiel - Embedded Developer

Bi-Weekly Summary

Over the past two weeks the integration team worked on and finished integrating opencv and darknet into the board's application. Additionally, the scoring application mode was built out and structurally defined. The board's application was then updated on the board and set up for usage and video recording. The mobile team set up the application so that it had an option to record test data for the machine vision algorithm. It is now possible to take the device and the board out to the skeet shooting range to record and gather data to train the board. The mobile team also added the ability to score a round without the device under a circumstance where the board was not available but a user still wanted to use a device to score a round as opposed to pen and paper. The mobile team then started working on the ability to save rounds on a user's phone so that the user can pause the round and go back to it at a later date and finish it. During this same time, the embedded team began to work on properly labeling images in Darknet, as this would make it easier to properly obtain accuracy. Additionally, the Embedded team also began to write a scoring algorithm in Python, and later began converting it to C++, as the main application runs in this programming language.

Past week accomplishments
- Completed major portions of the scoring application mode, waiting on machine vision team to finish implementing the detection and results methods
- Integrated- opencv into the application code base
  - Able to take pictures
  - Able to take videos
  - Able to parse single frames from the camera
- Integrated- darknet into the application code base
- Mobile Development - Andrew
  - Added ability to score a round of skeet shooting manually without the board if so desired
  - Added a separate option on the menu to record test data
  - Reworked button placements for a less cluttered UI
  - Fixed various reported bugs from test flight
  - Started working on implementing the ability to save rounds on the phone
- Embedded Team
  - Re-trained the dataset to create a new model in Darknet
  - Determined issues that are arising that are decreasing accuracy
  - Wrote a rough draft of a scoring algorithm in Python
  - Began implementing the rough draft by converting to C++

Individual Contributions

Name	Individual Contributions	Hours this Report	Cumulative Hours
Andrew Kicklighter	● Added ability to score a round of skeet shooting manually without the board if so desired ● Added a separate option on the menu to record test data ● Reworked button placements for a less cluttered UI ● Fixed various reported bugs from test flight ● Started working on implementing the ability to save rounds on the phone	14	47
Alexander Weakland	● Analyzed and ensured optimal Training and Testing data for vision model ● Created new training datasets to allow for better understanding of current accuracy ● Consulted about implementing scoring functionality ● Re-labeled images for Darknet	12	39
Nicholas Dykhuizen	● Resolved opencv and darknet integration issues ● Migrated code to use darknet's apis for video capture ● Fixed darknet structure errors when passing to child threads ● Updated scoring mode methods for machine vision team	11	60
Justin Elsbernd	● Integrated/Compiled embedded application onto the TX2 board ● Integrated OpenCV to work with the camera on the TX2 board	13	42

	● Implemented "shutdown" command to TX2 board for mobile application		
Joshua Heiser	● Wrote scoring algorithm in Python that would take frames and score them ● Began to convert the Python Script into C++ code	12	44
Paul Kiel	● Re-trained model using darknet ● Re-tested new model to get current accuracy of better dataset ● Analyzed images to determine issues that could arise when recording. ● Re-labeled images for Darknet	12	45

Pending Issues
- Build structure of training application mode
- Resolve some minor bugs of the embedded applications

Plans for the upcoming weeks

Over the next couple of weeks, including spring break, the integration team plans on defining a training mode by outlining commands and actions the mode can take. This mode's job is to take user input for scoring and also run that same input against the darknet vision network ; then comparing the results and providing useful testing and training data to the network. The mobile team plans on fully implementing the ability to save rounds/sessions so that if a user wanted to, they could pause their round and come back to it a few weeks later. The mobile team also plans on continuing to rework the UI at the request of the client. The Embedded team will be splitting their work into two major parts: Continued integration of darknet and implementation of the scoring algorithm. For the integration of darknet, the Embedded team will continue to analyze current datasets as well as keep track of new data that has been collected to ensure the vision model has the best results. For the integration of the scoring algorithm for darknet, the Embedded team will continue to work on implementing the scoring algorithm in C++, with a plan to have beta testing be run in the next couple of weeks.

Summary of weekly advisor meeting

      In the past meeting, each team updated Professor Duwe with their current progress. First, the Embedded team described their current progress in re-training the dataset. The Embedded team showed how the re-training of the model had effected accuracy, and some of the factors that were causing the accuracy to be lower than expected. The team also talked to Dr. Duwe about some of the issues that could be arising and why that would be potentially making Darknet have issues when trying to score a frame with a hit or miss. Additionally, the team talked about their progress in integrating the scoring algorithm in C++, and they set a goal of attempting to complete the scoring algorithm within the next few weeks. After this was done, the Integration team talked about their progress, which was the continued integration of darkent into the main C++ application, and how they had resolved many of the issues that they were having previously with OpenCV and darknet. The team also explained their success in integrating these features entirely onto the embedded board, and how they had implemented some commands that would make it easier for Professor Duwe (and the team) to collect data. Lastly, the mobile team talked about their progress in the previous weeks. The team talked about how the added ability of being able to score a round, even if the board is not present. Additionally, the team talked about how they had been cleaning up the app while fixing bugs that were present, and explaining to Professor Duwe that those changes were in the most updated version of the app. After this, the mobile team explained their progress in saving rounds and gave a brief update on what is planned on the mobile team's end for over break. After every team updated Professor Duwe on their progress, Professor Duwe expressed his expectations for what each team should be doing during the break, while allowing each team to express their concerns before allowing them to go continue their work on their respective parts of the project.