
EE/CPR E/SE 492 BI-WEEKLY REPORT 12

4/03/2020 - 4/16/2020

Group number

sdmay20-40

Project title

IC Chipz

Client & Advisor

Dr. Henry Duwe

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

The past two weeks the mobile team has worked to improve the mobile application through bug fixes and other various features. The most notable feature is that the ability to save a round on your phone, exit the app, and come back to that round at a later date was added with the ability to delete that round as well. A user can go to the skeet range, open the app, record a round without the device then save that round in the middle of the round and come back at a later date and open that same round with or without the device and start it back up like nothing happened. These changes have been pushed to the rest of the team on Test Flight. Finally, the integration team refactored the application to using static components. This was required because of the functional shift from process based communication to thread based communication. This transition required all resources and functions to be shifted away from shared memory and instead use a singleton design pattern. This was a large transition and is completely moving forward; another benefit of this transition is the code is a lot more readable and easier to understand and follow.

Past week accomplishments

- Mobile Application - Andrew
 - Resolved minor bugs in the mobile application
 - Added ability to save previous rounds on mobile device
 - Added ability to save a round without the board and then access that round later if you have the board and vice versa
 - Added ability to delete a round
 - Submitted the application to Test Flight and sent it members of the team
- Embedded Team- Josh & Paul
 - Fixed issues with OpenCV preventing application from running
 - Fixed issue with file not transferring properly in the scoring algorithm
 - Continued to debug issues in the scoring algorithm
 - Worked on getting full load of outputs set up for CVmodel
 - Parsed video into frames, printed results on them and then stitched them back together.
 - Continued documentation
- Integration Team - Nicholas & Justin
 - Refactored entire application to C++ objects rather than C functions
 - Implemented static instance design patterns on application
 - Resolved some log printing inconsistencies

Individual Contributions

Name	Individual Contributions	Hours this Report	Cumulative Hours
Andrew Kicklighter	<ul style="list-style-type: none">● Resolved minor bugs in the mobile application● Added ability to save previous rounds on mobile device● Added ability to save a round without the board and then access that round later if you have the board and vice versa● Added ability to delete a round● Submitted the application to Test Flight and sent it members of the team	16	73

Alexander Weakland	<ul style="list-style-type: none"> Continued to analyze data for the testing set, ensuring lens flare and other issues in the images were not affecting the results Tested for bugs, making sure the mobile application was stable and would not crash on the user for any reason, reporting the bugs as necessary. 	12	62
Nicholas Dykhuizen	<ul style="list-style-type: none"> Refactored entire application to C++ object based standards Using a global singleton design principle Rebuilt training and scoring mode to use multi-threading rather than multi-process management Using a singleton resource paradigm for resource sharing within threads (resource locks on camera via opencv and darknet object rather than recomputing data each time it is needed) 	20	90
Justin Elsbernd	<ul style="list-style-type: none"> Continued documentation Fixing OpenCV compile issues within the embedded system 	12	64
Joshua Heiser	<ul style="list-style-type: none"> Fixed issues with OpenCV preventing the application Fixed issues with the file transferring between OpenCV, the temporary destination, and the final destination Continued to debug the scoring algorithm with the C++ Darnet API 	12	68
Paul Kiel	<ul style="list-style-type: none"> Worked on getting full load of outputs set up for CVmodel 	12	67

	<ul style="list-style-type: none"> ● Parsed video into frames, printed results on them and then stitched them back together. ● Continued documentation 		
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Pending Issues

- Build training application mode
- Documentation of integration application
- Documentation of Darknet
- Documentation of Python scripts used to obtain accuracy values
- Bugs with the C++ scoring algorithm

Plans for the upcoming weeks

The mobile team will be in discussion with Dr. Duwe for other general stability improvements, as well as general UI changes as well. The mobile team plans on continuing to fix bugs and revise the application as well as look into emulating the board on a local device so that the mobile application can be demoed in the final presentation. The mobile team also plans on looking into saving and uploading the documentation to a program such as Doxygen for future senior design groups that may work on this project. In the next couple of weeks, the Embedded team continues to plan to fix the bugs currently present in the scoring algorithm and finish it so that it will work in all cases for night conditions in C++. In addition, the Embedded team plans to continue documenting their work so that any future team that would want to pick up on progress can easily do so. Finally, the integration team plans on building a rough outline for the training application mode. It has been on our todo list for a few weeks, but other pressing issues arose that needed to be solved before moving into the training mode. These issues have now been resolved, for the most part, so development can begin on the training mode.

Summary of weekly advisor meeting

In the past meeting, each team discussed their progress on working on the project to Professor Duwe. First, the mobile team explained their progress, as they were nearly able to complete saving the board and the functionality of an offline mode. The mobile team also explained their progress in fixing bugs, and documented their plan for future work. After this occurred, the Embedded team then discussed their progress. The team described the issues that were arising in the scoring algorithm, and why it was taking them longer to complete than expected. In addition, the team talked about the continued training via darknet and the progress made in trying to reduce common issues (such as lens flare) that were occurring in the algorithm. After this, the Integration team talked about their progress in converting the application away from forking, as the forks were causing issues on the embedded board application. They

described that they had completed about half of the needed work, and that they were on track to complete the project before the presentation in late April. After this occurred, Professor Duwe explained his expectations for the next week, and expressed his desire to have the team complete the final presentation for a practice session before the final presentation. After the teams and Professor Duwe discussed any issues that could arise, the teams left to complete their objectives for the week.