
EE/CprE/SE 492 BI-WEEKLY REPORT 04

3/1 - 3/15

Group number: sdmay21-05

Project title: AR Chess Advisor

Client &/Advisor: Dr. Joseph Zambreno is both our client and advisor

Team Members/Role:

Dillon Peters: Team Lead

Parker Bibus: Computer Vision Lead

Jake Aunan: Augmented Reality Lead and Tuesday MOM Scribe

Jamie Peterson: Mobile Lead and Thursday MOM Scribe

Aidan Sherburne: Report Manager and Computer Vision Developer

Brett Santema: Testing Manager and Mobile/Glasses Developer

Bi-Weekly Summary: During this period we primarily focused on integration of Computer Vision into the Android Application. To do so, we cleaned up the Computer Vision code and converted the jupyter notebook to a python file and then inserted this into our Android application python folder (previously configured). At this point it's impossible to debug without having the actual glasses so the team will now be meeting in the TLA to integrate and debug weekly for about 4ish hours on Tuesdays. Our first of these meetings was last week and we struggled to find the application to find the stockfish engine in the file system. We were able to resolve this however, now we are getting unable to read exceptions. We have created what we believe will be a fix for this issue and have pushed it but we won't be able to test it until Tuesday (3/16) again. Additionally, building on the glasses can be quite a pain so much of last week's meeting was trying to resolve build problems (see extended discussion section below).

Past two week accomplishments

- Dillon Peters:
 - Exported Python notebook to Android
 - Merged the app project updates into Master and resolved Merge Conflicts
 - Merged CV into Master
 - Created New branch for the export and debugging
 - Modified jupyter notebook to accommodate running on the Vuzix blade and converted the notebook to python script
 - Moved python script into correct folder and resolved the remaining build errors
 - Met with Parker and Jamie to debug the CV pipeline on Android
 - Builds fine, but got exceptions related to the stockfish engine. The first was being unable to find the engine executable. We were able to debug

to determine the correct location to place the engine. However we now get an exception that states we don't have read permissions on this file. We attempted to fix this, but did not have time to test this solution.

- Parker Bibus:
 - Met with Jamie and Dillon to start combining CV pipeline and Android app for use on the glasses
 - Helped Brett figure out correct settings and debug getting the UnitTests for the CV pipeline working
 - Added extra logic to configuration file so that only relevant configuration options are taken into account
 - Added basic file IO to the computer vision pipeline when scanning multiple images in a row.
- Jake Aunan:
 - Worked with Brett and alone on further debugging game loop and integration of CV pipeline with the Vuzix glasses.
- Jamie Peterson:
 - Finished the primary game loop for the application with a little python help from Dillon.
 - Met with Dillon and Parker to debug the pipeline on Android
 - It builds but there are bugs to deal with as mentioned in Dillon's accomplishments.
- Aidan Sherburne:
 - External configuration experiments and implementation
 - Researched methods to move our CV tuning and configuration outside of the python script to avoid hardcoding
 - Implemented configparser
 - Created and tuned .config file
 - Minor documentation improvements throughout the CV pipeline
- Brett Santema:
 - Worked with Jake on testing and debugging the glasses.
 - Unit tests for finding board corners and started full game tests.

Pending issues

We still need to determine how to solve some of the more difficult CV problems such as shadows, glares, and hidden pieces (ex: A Queen blocks a pawn from being seen by the camera)

Name	Individual Contributions	Hours this Period	Total Hours So Far
Dillon Peters	Exported Python Notebook to Android, Debugging and	8	43

	Testing with Parker and Jamie		
Parker Bibus	CV Pipeline improvements, CV integration into android app debugging	8	42
Jake Aunan	CV pipeline improvements, CV pipeline/glasses integration debugging	9	33.5
Jamie Peterson	Finished the primary game loop, Android Debugging for CV Pipeline	10	37
Aidan Sherburne	CV pipeline improvements, documentation, configuration, etc.	10	45
Brett Santema	Debugging glasses, unit testing improvements	8	24.5

Comments and extended discussion (Optional): The glasses are quite a pain to debug and build to. We are unsure if its the cord or the glasses themselves, but we spent nearly 90 minutes trying to even push to the glasses when we met Tuesday. The alternative is to use ADB which takes ~10 minutes to install. We will be trying a new cord when the team meets this Tuesday that should hopefully fix the problem.

Plans for the upcoming week

- Dillon Peters
 - Continue debugging the CV pipeline on android
 - Try to figure out why we getting unable to read exceptions
 - Figure out why stockfish.exe is not working on the glasses
 - May need to use the android binary instead and no longer use python to talk to stockfish. Would require about 3 hours refactoring, but is very doable.
 - If we can get a pass on the glasses to work, begin getting a license for chaquopy
 - Post the source code on github and apply for open source license
- Parker Bibus
 - Continue integrating CV onto android

- Add more granular options for file usage in the CV pipeline to configuration file
 - Help get the glasses and testing to use the new configuration setup
- Jake Aunan
 - Continue debugging CV and glasses integration
 - Continue working to improve CV pipeline and game state handling
- Jamie Peterson
 - Continue debugging with Dillon and Parker
 - Hopefully the pipeline will be debugged by the end of the week.
- Aidan Sherburne
 - To Be Determined
 - Helping out others where necessary
- Brett Santema
 - Continue debugging with Jake
 - Continue improving unit testing

Summary of weekly advisor meeting: We did not have a weekly advisor meeting since we had nothing substantial to demo to Dr. Zambreno, instead we sent him an email updating him on our progress and this was his response: “These integration tasks are always more difficult to execute than they would seem on paper, so it’s good you’re doing this now and not waiting until the last minute. I’m guessing the team doesn’t quite have the right mix of system skills (most of which is just linux admin) to debug these problems. They should all be fixable so don’t give up on your goals when you hit a bug.” We plan to meet with Dr. Zambreno next week as hopefully we can get the glasses fully integrated during our meeting tomorrow(3/16).