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EE/CprE/SE 492 BI-WEEKLY REPORT 05

3/15 - 3/29

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

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Bi-Weekly Summary: This period we were able to completely finish the interactions between the python and android components. We can now successfully run the full gameplay loop that includes the stockfish interaction (when the correct board state is determined). The loop itself is very efficient with less than a second between image capture and move display on the glasses allowing users to play nearly uninterrupted. Currently though, detection of the board state is inaccurate at best, and improvements are needed to improve detection accuracy. Parker will begin working on these improvements this week through a calibration setup that fine tunes the colors to try and deal with shadows and glares. Additionally, we will be starting on the final report, presentation, and poster this coming period.

Past two week accomplishments
- Dillon Peters:
  - Got Full Pipeline Running on Android
    - Continued to Debug and refactor/rewrite code on both the Android and Python side until I was able to get through multiple full loops indicating the core gameplay loop is functional.
    - We still have a variety of accuracy errors, and improvements to the CV module are needed to try and refine the accuracy, but the gameplay loop is now functional.
- Parker Bibus:
  - Debugged issues with the single loop pipeline on Android
    - Found issue causing the python to only run for one iteration instead of acting as a constantly running server.
  - Iteratively improved the pipelines ability to communicate and continue running on error.

- - ■ Modified error functionality to ensure that an error would only break from the pipelines current run instead of stopping the pipeline altogether.
    - ■ Verified the functionality of the communication files in place and added minor tweaks to improve their consistency.
  - Jake Aunan:
    - ○ Debugged issues with our android version of stockfish
    - ○ Created documentation for setting up an emulator that will correctly run our application
  - Jamie Peterson:
    - ○ Debugged issues with communication between stockfish and android.
    - ○ Debugged issues with the pipeline on android.
  - Aidan Sherburne:
    - ○ External configuration implementation and improvements
      - ■ Improved configparser implementation
      - ■ Tweaked default settings
    - ○ Begin planning our poster
  - Brett Santema:
    - ○ Helped Jake debug issues with stockfish on android.
    - ○ Made some improvements to unit testing with the CV module.

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	Got the full pipeline to run on Android,	7	50
Parker Bibus	Pipeline debugging and general pipeline improvements.	11	53
Jake Aunan	Debugging and documentation	8	41.5
Jamie Peterson	Pipeline Debugging	8	45
Aidan Sherburne	Config file improvements Poster planning	6	51
Brett Santema	Android debugging and CV testing	8	32.5

	improvements.		

Comments and extended discussion (Optional): Dillon's roommate may have gotten COVID and he is awaiting the test results. It is unlikely these results will be back by Tuesday morning and he is expected to miss the TLA working meeting. As such, he will start on the reporting aspect.

Plans for the upcoming week
- Dillon Peters
  - Create PIRM Powerpoint #2
  - Start on Final Report
- Parker Bibus
  - Complete merge of the android python code and the computer vision branch python code
  - Help create calibration functionality for the python pipeline to setup better color recognition accuracy.
- Jake Aunan
  - Continue to improve our pipeline and debug issues as they come up.
- Jamie Peterson
  - Help optimize the pipeline in any way I can.
- Aidan Sherburne
  - Begin poster work
  - Continue to help where I can with respect to code
- Brett Santema
  - Continue to work with Jake on debugging issues.
  - Continue improving CV tests and work with Parker to investigate image calibration.

Summary of weekly advisor meeting: We meet with Dr. Zambreno on Monday 3/22 to present our updated gameplay loop to him. He was pleased with the progress and gave suggestions for how to try and capture the gameplay with the glasses for our industry demo later this semester. Additionally, he stated he looks forward to seeing the stockfish engine implemented in the coming weeks (we completed this period). The reaminer of his feedback/comments revolved around small changes to the CV module to increase accuracy, things we hope to quickly change and test this week.