

Report Date: 12/16/2022

To: [ematson@purdue.edu](mailto:ematson@purdue.edu), [ahsmith@purdue.edu](mailto:ahsmith@purdue.edu), [lee3450@purdue.edu](mailto:lee3450@purdue.edu)

From: The Team Gangsture (Gesture Drone Control)

- Hyeongbin Park (The Leader / [mtanger@kw.ac.kr](mailto:mtanger@kw.ac.kr))
- Seunghwan Kim ([franz0602@stu.jejunu.ac.kr](mailto:franz0602@stu.jejunu.ac.kr))
- Yujin Lee ([yj5878@kw.ac.kr](mailto:yj5878@kw.ac.kr))
- Soeun Lee ([thdms8477@jejunu.ac.kr](mailto:thdms8477@jejunu.ac.kr))

## Summary

Every development was completed. Through this, the test was conducted to control the drone with gestures and subjects in real situation. The final presentation was prepared and finished.

## What “Gangsture” completed this week:

- **Gave the final presentation**
  - The final presentation was carried out on Wednesday (12/14/2022) for 25minutes including Q&A section.
  - The script was prepared. Presentation slides and the demo video were submitted to GitHub. To take the demo video, extra experiments on the system were tried several times.



Fig. 1. The picture of the final presentation

- **Completed to develop the entire system**
  - The face recognition AI was applied to the iOS application [1]-[3].
  - The version of MediaPipe on iOS was updated to the latest one [4], [5].
  - The buttons and screens needed for the iOS app were implemented.
- **Conducted additional drone experiments with subjects**
  - A total of 10 drone tests with a subject were conducted.
  - Subjects who had never controlled a drone before were selected randomly from KSW program students.

- The experiment process was recorded, and the total time taken, number of hits, success, failure, and time of four task points, including landing and takeoff were noted. These results will be analyzed more detail.



Fig. 2. The drone experiment with subjects

## Things to do by next week:

- Summarize all experiment results
- Submit the README file, final code with detailed comments, and the paper

## Problems or challenges:

- **Drone battery issue**
  - The battery duration was too short to test, so it took a long time to do several experiments.
  - It is recommended to consider buying extra batteries when purchasing a drone.
- **Insufficient experiment design**
  - The experimental design could not be spent much time, and there were some modifications in the process of conducting the experiment. Since it is not known how this will affect the experiment, it is necessary to consider experimental analysis.
  - To fix the error, gathering supplementary tests will be continued.
- **OpenCV on iOS**
  - OpenCV is only available as ObjectC for iOS.
  - Research and time were needed to bridge Swift code and Object-C code.

## References

[1] OpenCV, "OpenCV/OpenCV\_for\_ios\_book\_samples: 'opencv for IOS' Book samples," \*GitHub\*. [Online]. Available: [https://github.com/opencv/opencv\\_for\\_ios\\_book\\_samples](https://github.com/opencv/opencv_for_ios_book_samples). [Accessed: 16-Dec-2022].

[2] "Installation in IOS," \*OpenCV\*. [Online]. Available: [https://docs.opencv.org/4.x/d5/da3/tutorial\\_ios\\_install.html](https://docs.opencv.org/4.x/d5/da3/tutorial_ios_install.html). [Accessed: 16-Dec-2022].

[3] DieselDiesel 4 and Josh HomannJosh Homann 15.5k33 gold badges2929 silver badges3333 bronze badges, "Swift straight edge detection of live camera feed for IOS," \*Stack Overflow\*, 01-Jan-1965. [Online]. Available: <https://stackoverflow.com/questions/47667287/swift-straight-edge-detection-of-live-camera-feed-for-ios>. [Accessed: 16-Dec-2022].

[4] Szotp-Lc, "SZOTP-LC/Handtracker: Detect 3D hand landmark from video stream.," \*GitHub\*. [Online]. Available: <https://github.com/szotp-lc/HandTracker>. [Accessed: 02-Dec-2022].

[5] Noppefoxwolf, "NOPPEFOXWOLF/Handtracker: Detect 3D hand landmark from video stream.," \*GitHub\*. [Online]. Available: <https://github.com/noppefoxwolf/HandTracker>. [Accessed: 02-Dec-2022].