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From: The Team Gangsture (Gesture Drone Control)

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Summary

Every part of the development was going to be integrated into the iOS application. It was developed to connect to the drone and the internet programmatically, save a picked video, handle a streamed video for iOS environments, and get a value of the model in real time to control the drone. Additionally, the methodology part of the paper was revised. For this, the hand gesture dataset was collected to compare varieties.

What “Gangsture” completed this week:

- **Wrote and revised the methodology of the draft**
  - The methodology section contains three parts: (1) Dataset [1], (2) Hand Recognition with machine learning, and (3) Face Detection with deep learning.
  - Additional figures such as face image dataset should be attached later.
- **Completed collecting hand gestures images dataset for comparison variables**
  - Comparison variables are the number of people, hand type (left or right), and hand size (small or big). Consequently, six types of hand gestures dataset should be collected.
  - Hand recognition models were trained based on these datasets. Each model’s performance was evaluated and analyzed. These contents should be attached in a table format on the paper.
- **Made a function connecting to the drone and the internet programmatically using Swift**
  - The button to connect to the drone and the internet was made [2]. There are two buttons. If one button is pushed, the phone can be connected to the drone programmatically. If the other button is pushed, the phone can be connected to the specific internet.
  - It needs an Apple developer account to use Access Wifi Information, Associated Domains, and Hotspot Configuration. Finally, those capabilities were added to the iOS application.
- **Completed development of saving a picked video in Photo Library to Firebase using Swift**
  - Last week, it was developed to save a video on Bundle path. Based on this, a picker function was developed and the path was changed [3].
- **Developed to handle videos in a format appropriate for iOS environments using AVFoudation library**
  - It converts images taken by drones into MPEG formats to store them on the mobile device [4].
- **Controlled the drone in real time through the value of the model**
  - It succeeded in controlling drones with socket communication using the results of the model.
  - If the same result value of the model comes out 30 times in a row, a control signal is sent once.

- The video of the gesture and the drone video were simultaneously displayed on the screen.

Things to do by next week:

- Revise the methodology part and write the implementation of the paper
- Complete to collect face images dataset
- Develop and publish face detection model
- Organize and annotate codes
- Prepare for the final presentation
- Update MediaPipe version for iOS app

Problems or challenges:

- **Access problem when picking a video in the Photo Library**
  - There was no capability of App Sandbox, although there is a lot of previous research into the same problem. The solution to this problem was different from others.
  - The problem was solved using “info.plist”, a file that sets registration information and configuration for various programs.
- **The different version of MediaPipe between the model and the iOS app**
  - There are a few errors in the result value due to the version difference between the media pipe and iOS app.
  - Since this must be corrected, various methods will be applied [5]-[7].

References

[1] ″Hands,” mediapipe. [Online]. Available: https://google.github.io/mediapipe/solutions/hands.html. [Accessed: 02-Dec-2022].

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[4] ″This page requires JavaScript.,” Apple Developer Documentation. [Online]. Available: https://developer.apple.com/documentation/avfoundation/avassetwriter. [Accessed: 02-Dec-2022].

[5] ″MediaPipe on IOS,” mediapipe . [Online]. Available: https://google.github.io/mediapipe/getting_started/ios.html#prerequisite. [Accessed: 02-Dec-2022].

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