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From: The Team Gangsture (Gesture Drone Control)

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Summary

The midterm presentation ended on Friday. The script, slides and flowcharts for each development part were prepared by all of the members. There were two tests for the ML and drone in the real-world and both of them were perfectly succeeded.

What “Gangsture” completed this week:

- **Prepared for the midterm presentation**
 - The midterm presentation was conducted on Friday (10/23/2022) for 20 minutes, including the QnA section.
 - The script and slides for the midterm presentation were prepared with Purdue students.
- **Drew flowcharts**
 - A flowchart with the network was drawn. It was about the UDP socket between the iOS application and the drone.
 - A flowchart with an overview was drawn. This is about the architecture of this project. It includes the connection of the iOS application and the drone to send commands or video and the connection of the iOS application and the Google Drive to save the video.
- **Succeeded to apply the machine learning model in real-world situations**
 - The machine learning model was already trained, so should be tested in the real situation.
 - The model was applied on the Web environment and showed perfect performance of recognition. It was fast, light, and accurate.

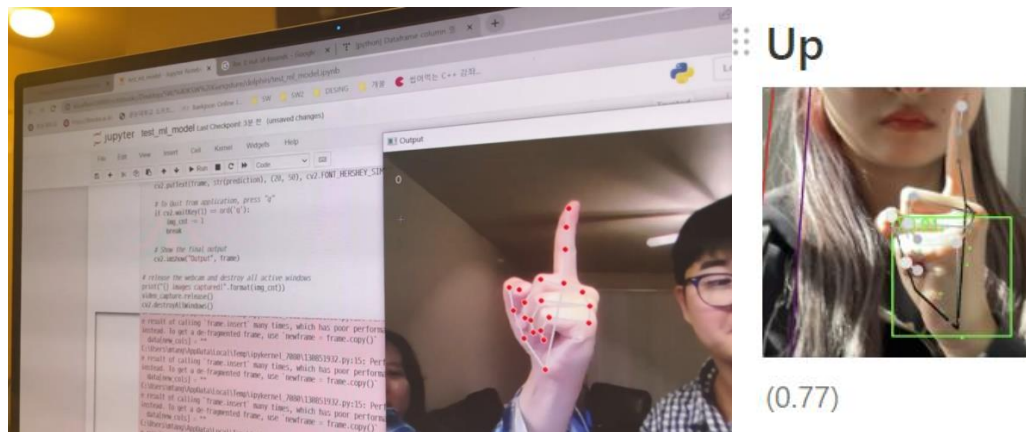


Fig. 1. Succeed to recognize gesture label 0

- The laptop could immediately check the battery condition of the drone.
- The drone could record videos and store them on the laptop [5].
- **Succeeded in flying a drone using a laptop with Python3.7**
 - The development language is python 3.7, and the libraries used for code are PYGAME, CV2, TELLOPY, which are provided by DJI.
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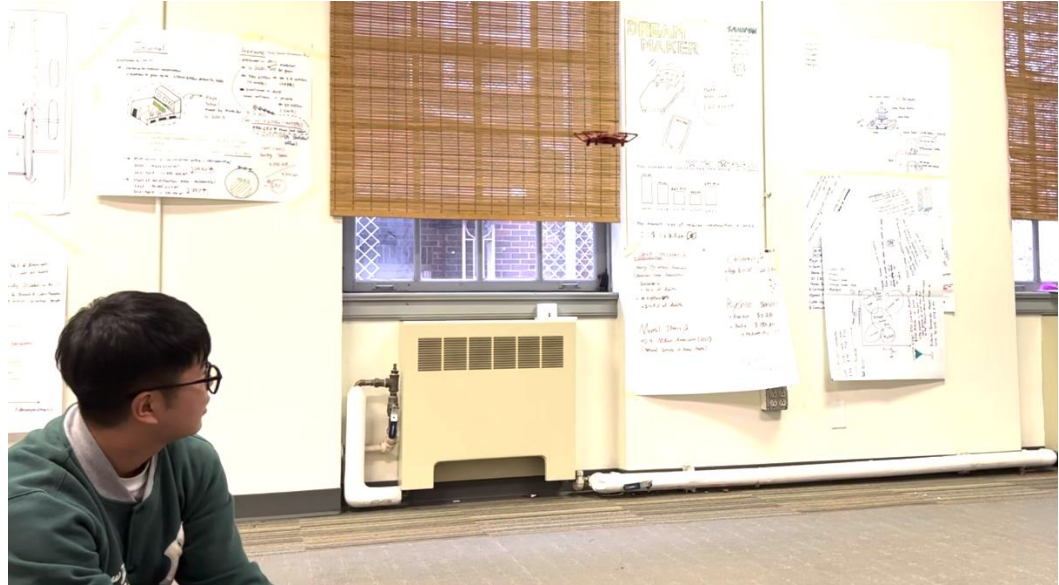


Fig. 2. Succeed to fly with connecting between the drone and the laptop

- PYGAME is used to recognize a key press that is the command to move the drone, which causes no delay in commanding the drone moving.
- To get keyboard input, we set the 4 parameters; “left-right”, “front-back”, “rotation”, “vertical”.

Things to do by next week

- Package and distribute the machine learning model to other development parts
- Using the AI model, the drone would be controlled through hand gestures instead of a keyboard in the laptop environment
- Search for socket.io which will be used to send a video from the drone to the iOS application
- Develop the draft iOS app with the machine learning model packaged by CoreML

Problems or challenges:

- **The script for the midterm presentation was changed many times than expected**
 - The machine learning model was being developed while writing the script. It made the script changed a lot.

References

[1] “Data Science and Machine Learning Bootcamp,” *Jovian*. [Online]. Available: <https://www.jovian.ai/>. [Accessed: 27-Oct-2022].

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[3] *Classifying images of hand signs*. [Online]. Available: <https://cs230.stanford.edu/blog/handsigns/>. [Accessed: 27-Oct-2022].

[4] “Tutorial: Using deep learning and CNNs to make a hand gesture ...” [Online]. Available: <https://towardsdatascience.com/tutorial-using-deep-learning-and-cnns-to-make-a-hand-gesture-recognition-model-371770b63a51>. [Accessed: 27-Oct-2022].