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Summary

We decided communication tools with Purdue students and set up rules for the whole team. And we searched and shared some materials and papers related to our project. Based on that, we made a decision about the UAV equipment.

What "Gangsture" completed this week:

- **Communication tool and rules**
    - First of all, we talked about what types of communication tools we will use. There are so many options and we decided to use Notion and Discord.
    - We invited Purdue students to both platforms and set some group policies. For example, if there are some changes on their schedule, just text in the schedule channel at Discord beforehand.
- **Searching papers and materials**
    - We read total 9 papers published by IEEE related to the project. The most relevant paper is "Deep Learning-Based Unmanned Aerial Vehicle Control with Hand Gesture and Computer Vision"[8].
    - After reading the papers, we also searched for some materials which would be helpful for development from Youtube, developer blogs and StackOverflow.
    - We studied and summarized knowledge about how we can use ML model in iOS Application(CoreML), ROS programming, and Google AI solution MediaPipe[10], [11], [12], [13].
    - Finally, we drew three structures of architecture which our project can have briefly.
- **Equipment**
    - We looked for various types of drones and organized the information for each drone into a table.
    - With the table, we compared some drones such as Tello Edu, Robomaster Tello Talent, and Mambo. And we decided to request Robomaster Tello Talent because it has a better performance than other drones.

Things to do by next week

- Studying drone ROS programming and AI vision solution MediaPipe.
- Making some sample codes with MediaPipe.
- Researching and studying papers related to our project

Problems or challenges:

- **We have to choose from 3 options of the architecture for project.**
    1. Using server including AI classification model between the drone and iOS service.
        a. Strength: The drone can network in a wider area.
        b. Weakness: It's hard to manage server individually.
    2. No server, direct interaction between the iOS device and the drone with AI classification model.
        a. Strength: We don't have to manage server
        b. Weakness: It can be hard to send gesture videos to drone from iOS App
    3. No server, direct interaction between the iOS device with AI classification model and the drone.
        a. Strength: We don't have to manage server.
        b. Weakness: The performance of the drone must be good, and the range of communication may be narrow.
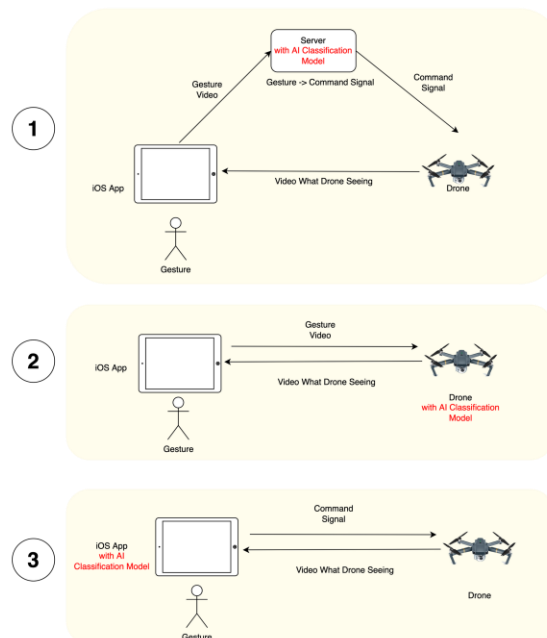

Fig. 1. Options of our architecture

- **We had to choose a suitable drone.**
    1. Our drone should be controlled to make not only directional but also dynamic movements. Tello drone was mentioned many times in a lot of papers as a efficient tool for gestural control and programming with that is easier than other models.
    2. There were three types of Tello drone. So we had to choose the suitable model for us considering with budget and performance. And we chose Robomaster Tello Talent.

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