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Summary
Throughout this week, the final Abstract is written by all members.

Furthermore, as the topic was chosen last week, the topic was more discussed in detail. Starting with small drones indoor tests, the first sets of data were collected to have feasibility tests for the visual and audio-based features.

Within the next week, the first draft of the Introduction will be done. Also, after the indoor drone test, it is necessary to fly two drones in the sky outdoors at Prof. Smith's farm.

What K2S3 completed this week:

- Writing the Abstract of this paper
    - Before writing the Abstract, by reading the abstract of more than 10 papers that are related to this project, each team member focused on the words and sentences that are frequently used.
    - 5 Abstracts are written by each member of the team. Then, by comparing each of the sentences, the final abstract of this paper is written.
- Having a meeting with the Ph.D. Student, Mia
    - Communicating a new topic, and the motivations of the topic in this project.
        - For the previous feedback from Mia, the last topic of this project might not have a specific motivation. Hence, a new topic had been considered, based on the feedback, and new motivations were founded which is "Drone Delivery Service".
        - The goal of this project is to minimize the collision between two drones, so the position, including altitude and width with a fixed distance of drones is estimated.
        - Two drones are located in the air, one attaching the microphone with one camera, and detecting a target drone by estimating the position of that target drone.
    - Answering prepared questions
        - After reading papers related to the project, some questions were drawn.
        - video file: The video file was split into 10 seconds in the experiment of Mia's paper.
        - research paper: A website called "overleaf" is helpful to write a paper in IEEE format.

        - equipment list: Before collecting data, all equipment and specific details of them should be listed.
        - dataset: For each type of two drones she used, 600 sets of data are collected in 5 days in the experiment of Mia's paper.
        - minimum distance before the drone collision: when the minimum distance before the drone collision cannot be found in previous research papers, it can be considered as future work.
        - microphone: Although the camera is already attached to the drones, there is no microphone. Due to this, an extra microphone should be considered that can be tapped under the drone. Mia recommended attaching an iPhone to record the sound of the drones.
- Reviewing papers related to this project
    - More papers are researched and assigned to each member to read and summarize. The papers are related to drone traffic management or the estimation of distance or altitude using audio and visual-based features.
- Learning how to operate a drone controller
    - Before collecting data with bigger drones, small drones, SYMA X5UW and SYMA X20P are used to practice controlling and collecting test datasets.
- Collecting the data indoor
    - The data is collected using two different drones: SYMA X5UW and SYMA X20P.
    - Using the 2020 Macbook pro 16inches, the video was recorded and extracted into audio and image file.

Things to do by next week

- Collecting the data outside
    - As the indoor drone tests are done, it is planned to collect data outside of the building.
    - The place of collecting data is the farm of Prof. Smith. Two drones, Evo and another drone, which is undecided yet, will be filed in the sky. Evo will record another drone and collect audio and visual data to estimate the positions. Although there will be only two drones flying at the same time, various types of drones will be considered to fly as another drone to analyze to compare and find the optimal estimation.
- Revising the Introduction
    - The first draft of the introduction is written. However, after the equipment list is decided, the introduction will be revised next week. During the revision, the sentence structures and meanings will be also checked again.
- Preparing for the mid-presentation
    - As the mid-presentation date is coming, preparing for the mid-presentation is required. Specific explanations and figures are needed.
- Testing with simple codes
    - With the data collected in 2 weeks, the data will be trained with simple codes of both visual and audio-based algorithms.

Problems or challenges

- Defining the terms for the paper
    - It was challenging to clearly define specific terms that explain the length or the distance between objects. Due to this, the terms used in previous papers will be researched more to find the terms that best explain the situations. Then, the exact terms to use in the paper will be discussed by the members again.
- Controlling small drones inside the building
    - As the space is limited, it was challenging to control the small drones to collect the test dataset. Also, as the small drones cannot stably hover, it was difficult to record at the same position. Furthermore, the batteries of the small drones do not last long to fly. Since the indoor data to test with simple codes are collected, more stable drones will be considered to fly next week.

References

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