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Summary

Throughout this week, various outdoor tests were done to collect image and audio data. Then, the data collected was analyzed using various methods.

For the next week, more data will be collected and analyzed. Furthermore, several parts of the paper for this project will be written and revised: the Abstract, the Introduction, the Literature Review, and the Methodology.

What K2S3 completed this week:

- Having several outdoor tests
    - The second, third, and fourth outdoor test was done this week on July 12th, 13th, and 14th. For the experiment, two drones were hovering in the air. The detecting drone's camera was filming the video of the target drone and an iPhone 6S attached to the detecting drone was recording sounds. The target drone was located in 9 different places with the location of the detecting drone fixed. At each point, 3 minutes of audio and video files were saved. Therefore, in total, 27 minutes of data were collected this week.
        - One difference from the outdoor test of last week is the types of target drones. Last week, the target drone was Matrice200 Version 1. However, the type of target drone used this week was Matrice200 Version 2. 3 minutes of data was collected using Matrice200V2.
    - Furthermore, no drone data was also collected to analyze the binary classification of drone detection. Without the target drone, only the detecting drone was hovering in the air to collect no drone data. In total, 24 minutes of no drone data were collected this week.
- Analyzing the data of previous outdoor tests
    - Gathering all data collected from the outdoor tests, the data was analyzed in various ways. 9 Point Classification and binary classification using vision and audio data were done. For audio, MFCC features were extracted to analyze using Machine Learning and Deep Learning models. For the vision part, the images are separated into frames and analyzed using the ResNet algorithm in Convolution neural network.

Things to do by next week

- Writing the second draft of the Literature Review
    - Various previous papers will be referred to write the Literature review. There will be improvements from the first draft including sentence structures.
- Revising the Abstract and Introduction
    - As there are updated results from the outdoor test experiments, the Abstract and Introduction will be revised. Furthermore, the keywords and the structures will be also revised based on previous related papers.
- Writing the first draft of the Methodology
    - As several outdoor tests were done, the Methodology will be written throughout next week. Specific settings and methods to collect data and specific algorithms used will be described in the Methodology.
- Collecting and analyzing the data collected throughout this month
    - More 9 Points data will be collected to analyze. Then, all data collected until next week will be analyzed again for better performance.

Problems or challenges

- Analyzing the difference in acoustic features between Matrice200 and Matrice200V2
    - Until last week, Matrice200 Version 1 was used as the target drone to collect data. However, Matrice200V2 was used to collect data this week. As the models of drones are the same. It was believed to have the same drone sounds for both Matrice200 and Matrice200V2. However, from the analysis, a new result was shown. The acoustic signals were different. Thus, only data from one version should be used to classify different location points.

References

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