

Report Date: 05/27/2022

To: [ematson@purdue.edu](mailto:ematson@purdue.edu), [ahsmith@purdue.edu](mailto:ahsmith@purdue.edu), [lhiday@purdue.edu](mailto:lhiday@purdue.edu) and [lee3450@purdue.edu](mailto:lee3450@purdue.edu)

- Dongwhan Lee (Leader) – [derick\\_lee@khu.ac.kr](mailto:derick_lee@khu.ac.kr)
- Yeeun Heo (Member) – [gjdpdms2005@soongsil.ac.kr](mailto:gjdpdms2005@soongsil.ac.kr)
- Youngseo Kim (Member) – [201910787@sangmyung.kr](mailto:201910787@sangmyung.kr)
- Juann Kim (Member) – [201920951@sangmyung.kr](mailto:201920951@sangmyung.kr)
- Heeyeon Shin (Member) – [567didi@khu.ac.kr](mailto:567didi@khu.ac.kr)

## Summary

Throughout this week, PowerPoint slides and the script for the middle presentation were done. Also, each member who is presenting practiced in front of the members various times to speak loud and convey the meaning well.

Furthermore, following the last week, more indoor data was collected to have a balanced ratio of three scenarios that are tested: a situation with a small drone, a big drone, and no drone.

While preparing for the presentation, writing the research paper was also continued. Three parts of the paper were written until this week: the Abstract, the Introduction, and the Literature review.

## What K2S3 completed this week:

- Writing script for middle presentation
  - For the middle presentation, the presentation script was modified. Some more content was added including the result of the vision and audio features.
- Preparing for a middle presentation
  - Presenters prepared their presentation in the same environment the presenting place, and time that presentation.
  - Based on the previous presentation that was prepared, some contents were deleted to set the given time
- Meeting with Ph.D. Student, Mia
  - The prepared presentation was shown, and Mia gave the feedback from that presentation.
  - Mia gave some suggestions to change some words in PowerPoint
  - From that feedback, some more sentences were added to a script
- Collecting the indoor drone data inside and training the data

- When the data was collected, the data ratio for a small drone, big drone and no drone was made to 1:1:2.
  - The number of data of none drone conditions is doubled compared to the small drone and big drone data in order to detect whether the image shows a drone or not.
- Modifying PowerPoint slides
  - Based on feedback from Mia and team members, some PowerPoint slides were modified.
- Training data of images and audio features.
  - For the middle presentation, the data training from the indoor test was completed, so, the result was drawn.
  - There are several methods to train the data including SVM, KNN, etc.

### Things to do by next week

- Finishing the first draft of the Literature Review
  - Based on the various related papers and the summary written by the team members, the first draft will be done throughout the following week.
- Finalizing the Introduction and Abstract before the paper submission due date
  - Gathering all feedback, the last version of the Introduction and Abstract before the first paper submission due date will be done and submitted.
- Listing up questions and feedback that will be given on the mid-presentation day
  - Questions and feedback about the project and the presentation will be listed and will be answered by the members. This process is important as it can be helpful to prepare the final presentation and set up the outdoor experiment.

### Problems or challenges

- Raising the voice to present in front of the audience
  - As the room is big and high enough to absorb sounds, it is important to raise one's voice to make sure everyone can listen and understand the content of one's project. However, since the team members have not experienced a lot before, it was

challenging to raise their voices. So, by presenting in front of people various times, it was possible to solve this problem.

## References

- [1] Flórez, Jimmy, et al. "A review of algorithms, methods, and techniques for detecting UAVs and UAS using audio, radiofrequency, and video applications." *TecnoLógicas* 23.48: 262–278, 2020
- [2] H. Liu, Z. Wei, Y. Chen, J. Pan, L. Lin, and Y. Ren, "Drone Detection Based on an Audio– Assisted Camera Array," *IEEE Xplore*, Apr. 01, 2017
- [3] Leong, Wai Lun, et al. "Vision–based sense and avoid with monocular vision and real–time object detection for UAVs." *2021 Int. conference on unmanned aircraft systems (ICUAS)*. IEEE, 2021
- [4] Zagoruyko, Sergey, and Nikos Komodakis. "Wide residual networks." *arXiv preprint arXiv:1605.07146*, 2016