

Report Date: 06/03/2022

To:

- ematson@purdue.edu
- ahsmith@purdue.edu
- lhiday@purdue.edu
- lee3450@purdue.edu
- wang4070@purdue.edu

From: TN

- Eunyoungh Bang (yeong35@kangwon.ac.kr)
- Yeongmin Seo (dudals1003@cu.ac.kr)
- Jeongyoun Seo (201810773@sangmyung.kr)
- Raymond Zeng (zeng172@purdue.edu)

Summary

- The final draft paper was rewritten with feedback from Mia.
- Literature review changed the structure of a paragraph.
- The words of the paper were refined to fit the English format.
- The training Machine Learning code was written.

What TN completed this week

- The training Machine Learning code was written.
 - MFCCs were used to feature extraction. SVM and Random Forest was used to Machine Learning model
 - All models show 100% accuracy. Dataset or code will be checked.
- Literature was written problems and solutions for each other's research. [1]-[7]

Things to do by next week

- Thinking about what kind of Pythorch version is used and installed.
- Machine Learning study will begin [8].
- Training code for Machine Learning will be finished.

Problems or challenges:

- What kind of Pytorch version will be installed?
- Why do every model show 100% accuracy?

References

- [1] Y. Wang, F. E. Fagian, K. E. Ho and E. T. Matson, "A Feature Engineering Focused System for Acoustic UAV Detection," *2021 Fifth IEEE Int. Conf. on Robot. Comput. (IRC)*, 2021, pp. 125-130, doi: 10.1109/IRC52146.2021.00031.
- [2] S. Al-Emadi, A. Al-Ali, A. Mohammad and A. Al-Ali, "Audio Based Drone Detection and Identification using Deep Learning," *2019 15th Int. Wireless Commun. & Mobile Comput Conf. (IWCMC)*, 2019, pp. 459-464, doi: 10.1109/IWCMC.2019.8766732.
- [3] S.Jamil, Fawad, M.Rahman, A.Ullah, S.Badnava, M.Forsat, S.S.Mirjavadi, "Malicious UAV Detection Using Integrated Audio and Visual Features for Public Safety Applications", *Sensors (Basel) vol. 20,14 3923.* , 2020, doi: 10.3390/s20143923.
- [4] S. Seo, S. Yeo, H. Han, Y. Ko, K. E. Ho and E. T. Matson, "Single Node Detection on Direction of Approach," *2020 IEEE Int. Instrum. and Meas. Technol. Conf. (I2MTC)*, 2020, pp. 1-6, doi: 10.1109/I2MTC43012.2020.9129016.
- [5] S. Li et al., "Convolutional Neural Networks for Analyzing Unmanned Aerial Vehicles Sound," *2018 18th Int. Conf. on Control, Automat. and Syst. (ICCAS)*, 2018, pp. 862-866.
- [6] H. V. Kooops and F. Franchetti, "An ensemble technique for estimating vehicle speed and gear position from acoustic data," *2015 IEEE Int. Conf. on Digit. Signal Process. (DSP)*, 2015, pp. 422-426, doi: 10.1109/ICDSP.2015.7251906.
- [7] E. Kubera, A. Wieczorkowska, A Kuranc, T. Słowik "Discovering Speed Changes of Vehicles from Audio Data." *Sensors (Basel, Switzerland) vol. 19,14 3067.* , 2019, doi:10.3390/s19143067
- [8] holehouse, "Stanford Machine Learning", holehouse.org. <http://www.holehouse.org/mlclass/> (accessed June. 02, 2022)