

4th Weekly Report

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To: include all managers
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From: GO duck

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1 Summary

- Found a better alternative open-source project to ClusterDuck, it is called Meshtastic.
- Gave the presentation for which team GO duck had prepared on Wednesday.
- Tested the hardware in various sites for the first time.
- Received feedback on the presentation from Minji.

2 What GO duck completed this week

- Team:
 - Gave the mid-presentation on Wednesday. The presenters were Younguk and Sujee, the other two members carried out the Q & A session. Prof. Smith made a few remarks about the presentation during the Q & A session; were mostly about typos and a technically incorrect description, made changes accordingly. Were also told not to replete the paper with path loss models as those do not draw any meaningful conclusion for the project.
 - Tested the hardware outside the office to get rough measures in the different testing scenarios the team is planning for. The maximum range for both devices was approximately 300m in an open area with the grass and concrete. In the tunnel below PMU, the range was around 100m but only in a clear, straight line of sight. The signal could not reach beyond a corner. A few things to consider when conducting a proper field testing: Fresnel zone, the height, placement, types and directions of antennas.

- Gwangyeok Kim:
 - Studied how Meshtastic works: configurable variables in the firmware, device settings, mesh broadcasting algorithm, packet structure, etc.
 - Flashed V2.0.14.2baaad8 beta firmware for Meshtastic on ESP32 TTGO T-Beam V1.1 boards. Meshtastic is much more comparable to goTenna feature wise. No longer using ClusterDuck as Meshtastic appears to be a better counterpart.
 - Made presentation slides, wrote and revised the script for Younguk's part.
 - Prepared a list of anticipated questions concerning the project for the Q & A session.
- Keonwoo Lim:
 - Structured the presentation slides and filled in the contents.
 - Helped writing presentation script.
 - Prepared anticipated questions for QnA.
- Sujee Noh:
 - Summarize path loss model related work for baseline
 - Add contents to midterm presentation
 - Wrote script for midterm presentation
- Younguk Maeng:
 - Read the documentations of Meshtastic
 - Prepare materials for midterm presentation
 - Had a midterm presentation
 - Set up T-Beam and tested meshtastic communication using application

3 Things to do by next week

- To write about Meshtastic in the paper and revise the introduction following the feedback.
- To complete abstract, related work and methodology sections in the paper. Plan to send the paper for another feedback before Friday.
- To understand how goTenna is relaying messages through its mesh network, and to conduct proper field testing with the devices and to collect usable datasets.

4 Problems or challenges

- ClusterDuck

Problems:

 - The project as a whole is rather convoluted; the github page is not updated properly, and setting up the necessary devices was not an easy process.
 - Smartphone's OS compatibility issue; Was not able to make communications between Android and iOS devices.
 - Each type of ESP32 board comes with its own configuration, causing unexpected issues, i.e. a Papaduck on Heltec board was not able to receive any packets from a Mamaduck on T-beam board.
 - No ease of data collection; CDP requires a gateway (Papaduck in this case) that collects all data like LoRaWAN, while goTenna and Meshtastic have useful log data accessible on the nodes themselves.

Solution:

- Using Meshtastic instead. Flashing the necessary firmware on a board is very simple and straightforward. Meshtastic has a comparable companion application to goTenna's and a web client, showing detailed log data.