

Report Date: 01/27/2023

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Summary

- Set up the development platform.
- Implemented the code for LoRa mesh network and visualizing server.
- Ran the detection example code with TensorFlow-Lite on the ESP board.
- Read up on and organized the related researches and papers for writing the paper.

What BTT completed this week

- Soonchan Kwon
 - Researched the pros and cons and possibility to implement of ESP-IDF and Arduino to choose as the development platform.
 - Chose Arduino as the development platform and read up on the related libraries based on Arduino
 - Set up the development environment for Freenove ESP32-WROVER CAM board by Arduino IDE and NeoVim.
 - Created Github repository of the project and divided the branches into development parts.
 - Wrote version specifications, installation guide, excluded secret value files list and set up guide in README of KSW Github repository.
 - Implemented LoRa mesh network code for UAV.
 - Implemented LoRa mesh network code for Ground Control System(GCS).
 - Implemented MQTT gateway code for GCS.
 - Implemented Node server to visualize mesh network.
- Gihwan Kim
 - Made up contents and contents table for paper works.
 - Ran the sample code on heltec lora32 v2 for running TensorFlow Lite.
 - Investigated ESP32 resource monitoring methodologies.
 - Read up on UAV terror incidents and drone counter system researches for paper works.
 - Wrote introduction sections for paper works.
- Nahyeong Kim
 - Set up the Arduino IDE environment to implement the LoRa mesh network for Freenove

ESP32-WROVER CAM board.

- Analyzed the RHMESH and RH_RF95 library used to implement the LoRa mesh network.
- Organized the contents from the papers searched by Prakshi, Purdue student.[1]
- Researched and studied about the modem configuration to optimize the performance of LoRa model for our environments.
- Read up on and organized the existing papers about drone networking.[2-8]

- Nawon Kim

- Set up the Arduino IDE environment to develop drone detection method for Freenove ESP32-WROVER CAM board.
- Read up on the projects that run TensorFlow-Lite on ESP board.
- Ran TensorFlow-Lite examples on ESP board by referring to GitHub.[9]
- Read up on the paper that describes GCS for detection and networking.[10]

Things to do by next week

- Prepare dataset and pre-processing data for UAV detection.
- Decide pre-trained model for UAV detection and low power system.
- Assemble and solder the boards, LoRa transceivers and antennas.
- Set up experiment environment and experiment process.
- Refactor the mesh network code for better design and performance.
- Implement code to monitor the resources and performance.
- Prepare the mid presentation.

Problems or challenges

- Networking
 - How long will it be possible to communicate.
 - How we can optimize the board well.
- Detection
 - Decide pre-trained model for UAV detection and low power system.
 - How to monitoring memory usage and inference time.
 - How to manage tiny memory and CPU resources for UAV detection on low power system.

References

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