Report Date: 11/04/2022

To: ematson@purdue.edu, ahsmith@purdue.edu, lee3450@purdue.edu

From: Team Coyote(Sensors & Network)

- Hyemin Lim (<u>freemini2@cau.ac.kr</u>)
- Nayoun Kim (202010766@live.wsu.ac.kr)
- Jaehui Boo (32192075@dankook.ac.kr)
- Hyeongjun Kim (aa980305@cu.ac.kr)

### **Summary**

The current state of the project takes about 30 minutes to send audio sensor packets. The research was conducted to increase the speed of data transmission and reception between gateway using LoRaWAN. Yet, it was judged that the method was limited. To change the current concept of the project and decide whether to implement it in real-time or proceed as it is. After a meeting with Tony and Coyote team 2, Tony suggested a new architecture and a way forward. The architecture will change Endnode from NodeMCU to Raspberry Pi, and it will proceed by receiving audio data.

# What Coyote Team completed this week:

- Researched how to increase the speed of transmission and reception of audio data packet via LoRaWAN.
- Had a meeting with Professor Tony & Coyote team2.
- Decided whether to make it real-time or not.
- Redefined the architecture.
- Had a meeting about ideas related to camera sensors.
- Set the raspberry pi for the LoRa Hat testing.
- Searched for equipment that supports LoRaWAN.
- Researched about localization.
- Researched how to register LoRa Hat in network server.

### Things to do by next week

- Write a code about localization
- Connect LoRa hat to raspberry pi using ESP32
- Register LoRa hat with gateway

## **Problems or challenges:**

- Register LoRa hat with a network server.
- Put a machine learning model related to camera sensors into Raspberry pi by the deadline.
- Functional ideas using camera sensors are needed without machine learning model.

### References

[1] Wave Share. "SX1262 868M LoRa HAT" Wave Share. Accessed: Nov, 2, 2022. [Online]. Available: https://www.waveshare.com/wiki/SX1262 868M LoRa HAT

[2] Spotpear. "Raspberry Pi SX1262 868M LoRa HAT User Guide" Spotpear. Accessed: Nov, 2, 2022. [Online]. Available: <a href="https://www.spotpear.com/index/study/detail/id/244.html">https://www.spotpear.com/index/study/detail/id/244.html</a>

[3] sb Components. "Getting started with LoRa™ Hat for raspberry pi" sb Components. Dec, 10, 2021. [Online]. Available:

https://shop.sb-components.co.uk/blogs/posts/getting-started-with-lora-hat-for-raspberry-pi

- [4] Jac. K. "Gateway SX 1262" The Things Network Forum. Jun 13, 2021. [Online]. Available: <a href="https://www.thethingsnetwork.org/forum/t/gateway-sx-1262/48750">https://www.thethingsnetwork.org/forum/t/gateway-sx-1262/48750</a>
- [5] viveknayyar007 "How To Change Default Internet Connection Sharing IP Address Range" Tom's Hardware Forum. Dec, 12, 2013. [Online]. Available: <a href="https://forums.tomshardware.com/faq/how-to-change-default-internet-connection-sharing-ip-address-range-1606758/">https://forums.tomshardware.com/faq/how-to-change-default-internet-connection-sharing-ip-address-range-1606758/</a>
- [6] Lydia. C. "Connecting a Raspberry Pi to a Laptop Display" Atomic Object. Jun, 9, 2019. [Online]. Available: <a href="https://spin.atomicobject.com/2019/06/09/raspberry-pi-laptop-display/">https://spin.atomicobject.com/2019/06/09/raspberry-pi-laptop-display/</a>
- [7] Dexter Industries "Connecting to Raspberry Pi without a monitor for Beginners" Dexter Industries. Accessed: Nov, 2, 2022. [Online]. Available: <a href="https://www.dexterindustries.com/howto/connecting-raspberry-pi-without-monitor-beginners/">https://www.dexterindustries.com/howto/connecting-raspberry-pi-without-monitor-beginners/</a>
- [8] jurosofish, "multilateration" Github.com, Nov, 4, 2022. [Online]. Available: <a href="https://github.com/jurasofish/multilateration/pulse">https://github.com/jurasofish/multilateration/pulse</a>