

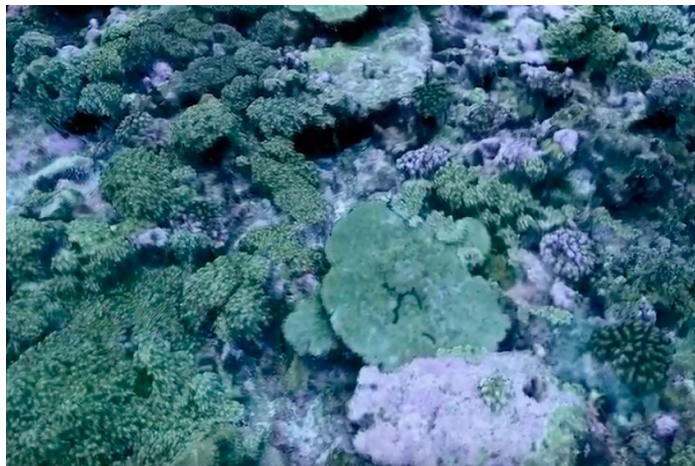
Smart Integrated Tile



Final Oral Presentation
Sam, Ivy, Tony

Motivation Why are we doing this?

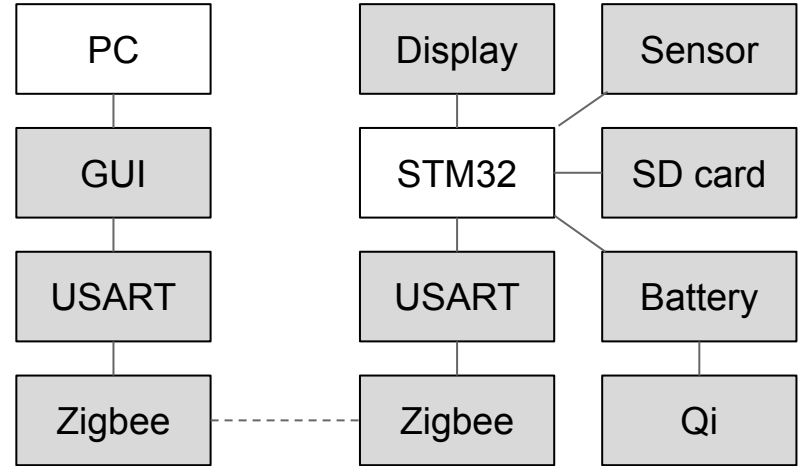
- Scientists build 3D models to keep track of changes of coral reefs
- Aligning 3D models needs **depth** information
- Depth measured manually: **hard, not accurate**



Objective What are we doing?



Capture depth
information



Overall workflow

Challenge 1 Clear Display

- **Problem:** Depth should be visible for diver's camera
- **Solution:**



LED



E-ink

E-ink has better visibility



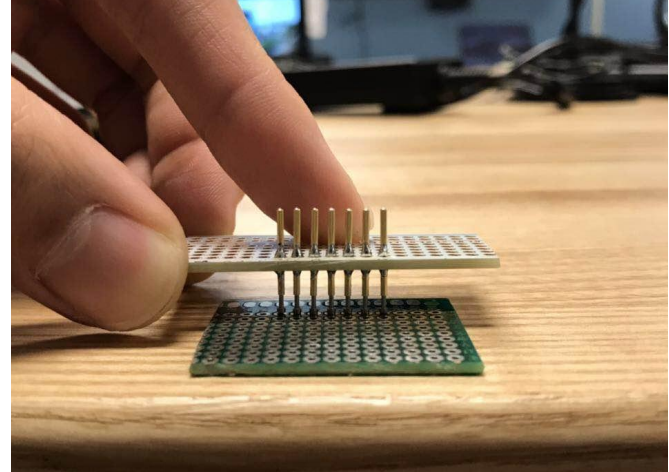
Underwater test (1.5m)

Challenge 2 Waterproof connection

- **Problem:** No buttons. No plugs. But need to reprogram without plugs.
- **Solution:**



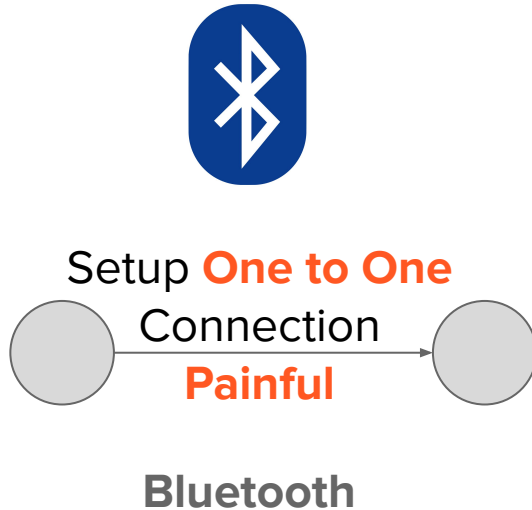
Water-resistant plugs



Pogo pin

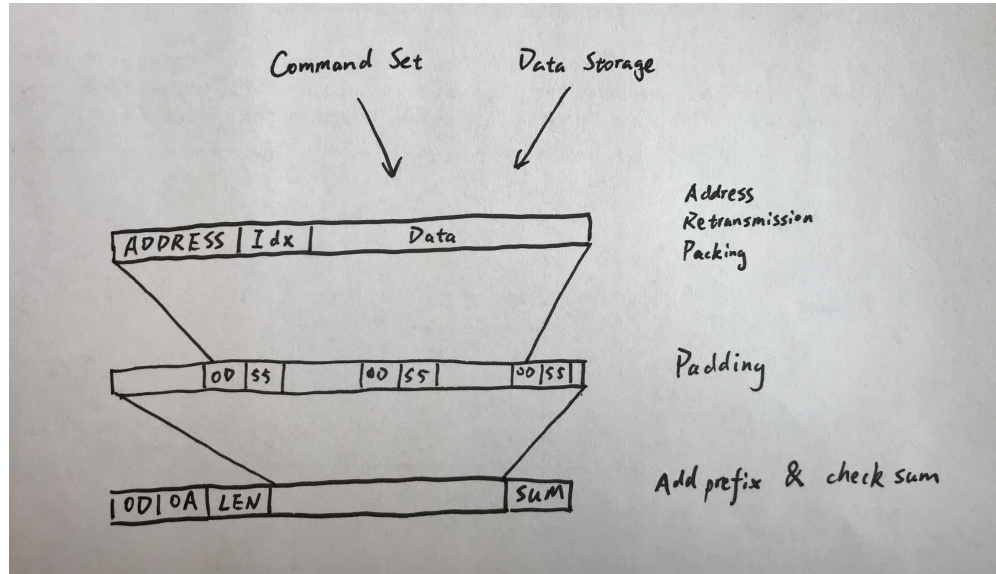
Challenge 3 Wireless Data transmission

- **Problem:** Need to download data from device for back-up
- **Solution:**



Challenge 4 Reliable transmission

- **Problem:** Zigbee using broadcast; Byte error rate is around 1%
- **Solution:** protocol used to indicate destination and check if there is a error.



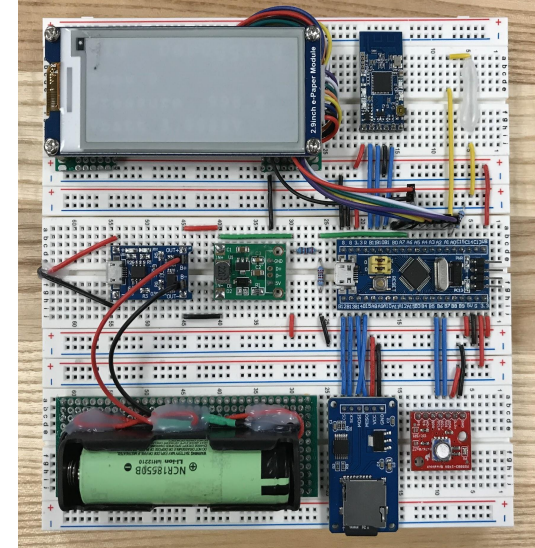
Big Issue

- The first prototype is dead, after running for 2 weeks.
- It's not diagnosable



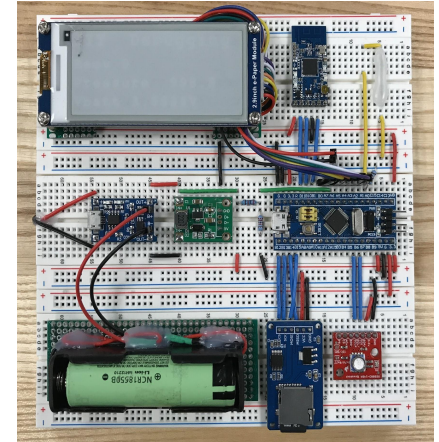
What we did

- We built two more
 - Potted
 - Underwater test
 - Breadboard
 - Data transmission
 - Durability test



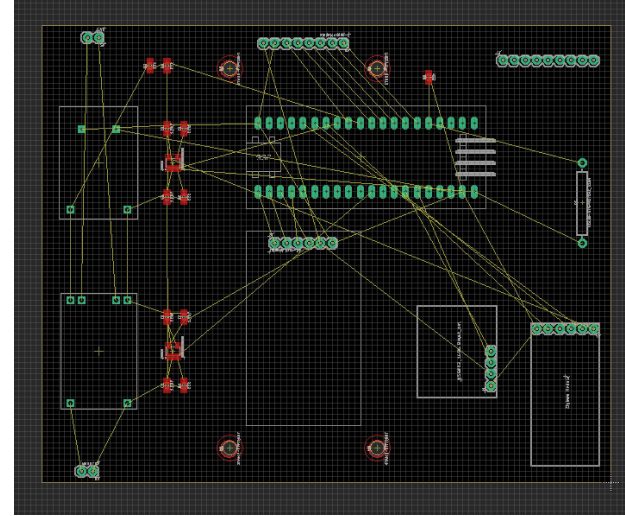
Conclusion

- Built two prototypes
- Developed data transmission protocol
- Developed GUI for users
- Designed overall schematics
- Display: E-ink
- Waterproof: Pogo pins
- Transmission: Zigbee



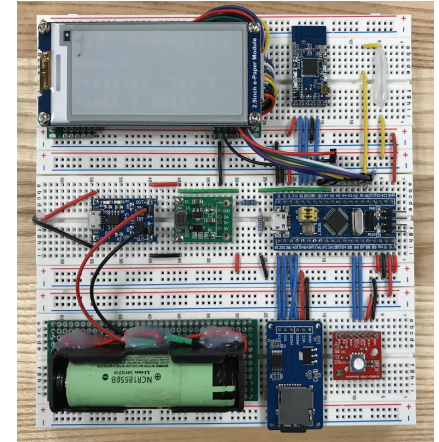
Future works

- Finish PCB design for prototype 2
- Test data transmission protocol
- Hand over to people who will work on this project in summer

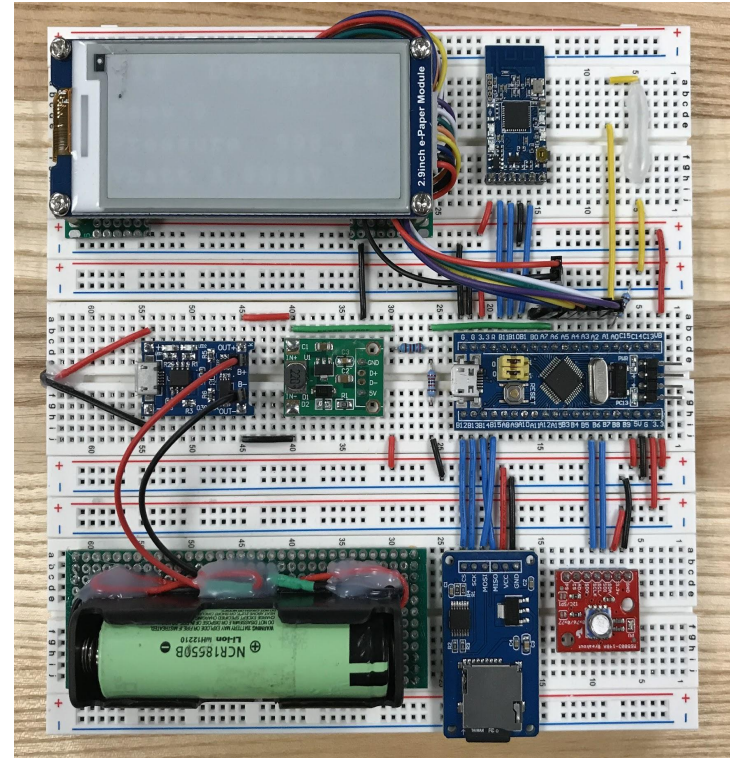
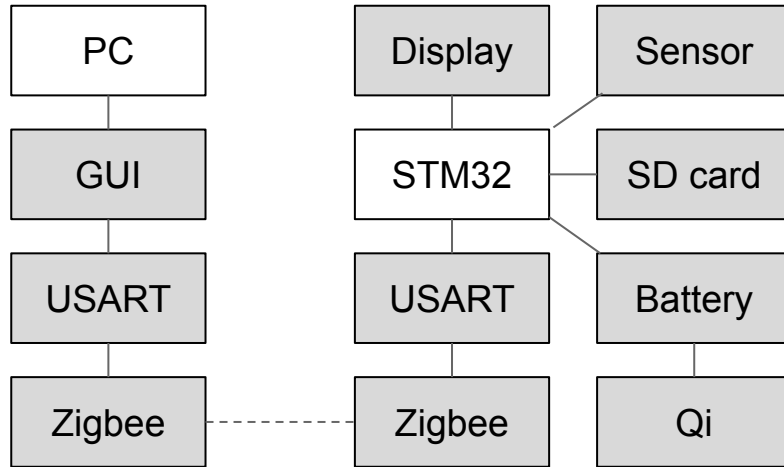


Q&A

- Display: E-ink
- Waterproof: Pogo pins
- Transmission: Zigbee
- Transmission protocol



Q&A



Thanks!