

Senior Design Weekly Meeting #11

Meeting Minutes

11/18/2020 15:30 - 17:00

CM/TM: Dr. Honggang Zhang

Students: Zhuoming Huang, Lucas Lomba, Yue Sun, Alinson Sanquintin

- **Agenda**

1. SAR Experiments Related
2. Deep Learning Related
3. Thanksgiving week meeting schedule

- **Notes**

1. SAR Experiment related

- a. The sensor is too close to the objects:

In the experiments of sensing two objects (metal boxes) 20 or 60cm apart and 1m away from the sensor, the objects were not placed far enough for distinguishing the objects (even if the angle resolution is small(good) enough.)

The antenna array has a FOV of 120 degrees, the max horizontal range can be observed is $W = 2d \times \sin(60^\circ) + L$, where d is the distance to objects, L is the length of horizontal antenna array.

Place the sensor further away from objects, in the meantime use objects with rough surface (e.g. cloth) for detection and place them further apart (see equation above).

- b. Try to use Jetson Nano (or GPU machines from Gibbs) for collecting depth images with ZED mini
- c. Use the radar data synthesizer and CAD models (sets of 3d points) provided by the Hawkeye to generate some radar data for model training.
(<https://github.com/JaydenG1019/HawkEye-Data-Code>)
- d. Continue on finding the error/phase difference due to movement of slider.

2. Deep Learning Related

- a. There is an issue with Gibbs that it cannot install the latest version of PyTorch
- b. Usually the Conda environment will automatically detect the coda and pytorch modules
- c. The network using 2d inputs is ready to use, currently looking for a solution

3. Thanksgiving week meeting schedule

a. Same time from 3:30pm on Wednesday (11/25)

- Follow-up

1. Same number of samples (256) with a smaller sample rate (2047ksps) and longer ramp-end-time (133us) were used in the recent experiments. Data were collected at 3 horizontal positions (20mm apart), with 64 vertical positions each. It took about $20\text{min} \times 3 = 60\text{min}$.
2. Data were collected for analyzing the phase difference due to movements of slider. (80~81 positions each slide, move the slider 10cm horizontally to collect the second set of data after the first set is collected, 40 overlapped positions) Another data collection may be needed (takes around 1hr).