ECE Co-Op Internship Project: Detection Pattern Standarization

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Objectives

- ❑ Setup the test field in a cooperated laboratory
  - Mount sensors to the platform
  - Setup wiring and power connection
- ❑ Perform the test and collect data
- ❑ Process the collected data
  - Eliminate the false triggers
  - Ground truth representation

Motivations and Tasks

- ❑ Motivations
  - Standardize the ideal detection pattern with the ground truth representation
  - Verify the accuracy of the ideal detection pattern
- ❑ Tasks
  - Setup the test environment and perform the test
  - Create the ground truth with the collected data

Task Challenges

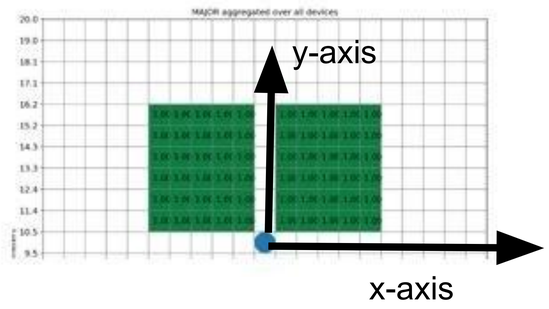
- ❑ Wiring failure
  - False connection
  - Unworkable adaptors and cables

Acknowledgement

I would like to thank everyone I worked with in Signify for helping me become a well-educated engineer.

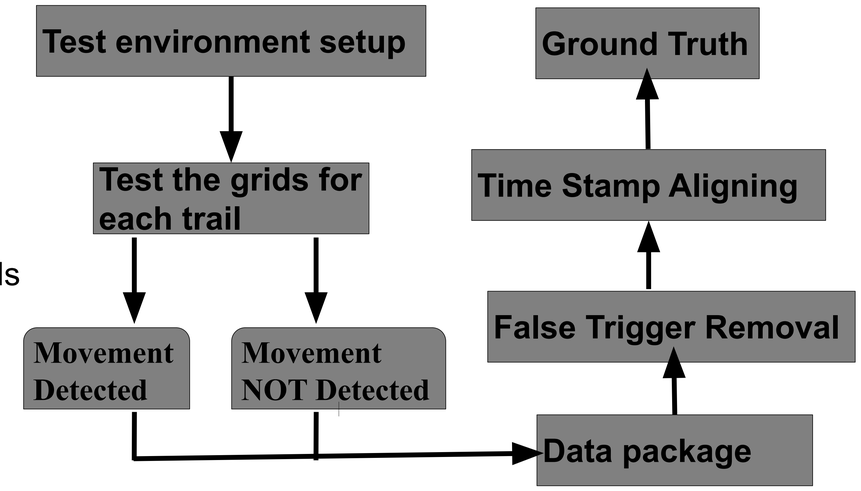
Methodology

Data collecting

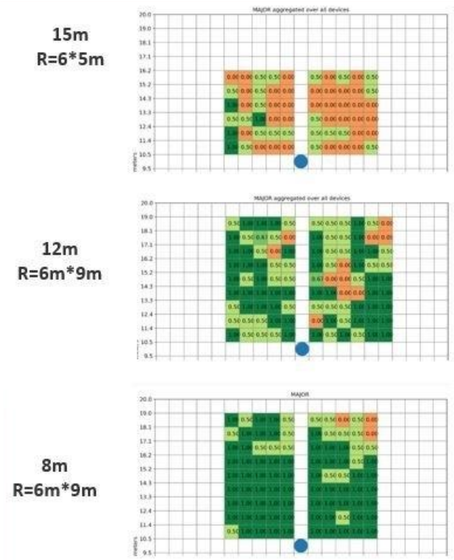


- Divide the test field into several 1m x 1m grids
- Run the first trail and collect the data
  - walk along with the x-axis grid by grid
- Run the second trail and collect the data
  - walk along with the y-axis grid by grid

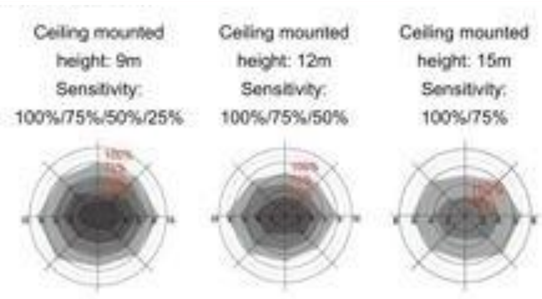
Standardization Flowchart



Results



- ❑ Dark green -> 2/2 truth count
- ❑ Light green -> 1/ 2 truth count
- ❑ Orangle -> 0/2 truth count



← Ideal detection pattern
Detecting diameter @ height

- ❑ diameter =~6m @15m
- ❑ diameter =~8m @12m
- ❑ diameter =~8.5m @9m

← Tested detection pattern with ground truth representation
* operating at 100% sensitivity

- ❑ @15m, not even close to the ideal pattern
  - contain too many 0/2 trail truths
- ❑ @12m, somewhat accurate, but not consistent
- ❑ @8m, somewhat accurate
  - closer to the center, more accurate

Possible Improvement

[1] Find a wider laboratory that can increase the number of grids along with the x-axis
[2] Put the other two quadrants into use.