

# **RALAZABA Electronics**

## **Weekly Report**

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### **Done**

We acquired measurements from multiple sensors simultaneously such that the environment sensing unit can achieve 360-degree vision of the environment. The results are explained in Sensor Employment section.

We established the mechanical design and are currently working on 3D Printed parts of Environment Sensing Unit and Self Localization Unit

### **To Do**

We will finish mechanical design and obtain a stable system such that all the components of the robot are placed in the chassis and fixed.

## Sensor Employment

In this study, we tested the ability of visualization of the environment using four-fused sensors. The tests took place in the figure 1. As shown in the figure, a cylinder with 5 cm diameter placed at (0 cm,0 cm), a cylinder with 10 cm diameter placed at (54 cm,0 cm) and a triangular prism with 7 cm edge-length placed at (40 cm, -47 cm).



Figure 1 The test setup

The first measurement was taken from (24 cm,0 cm) point and it is shown in figure 2.

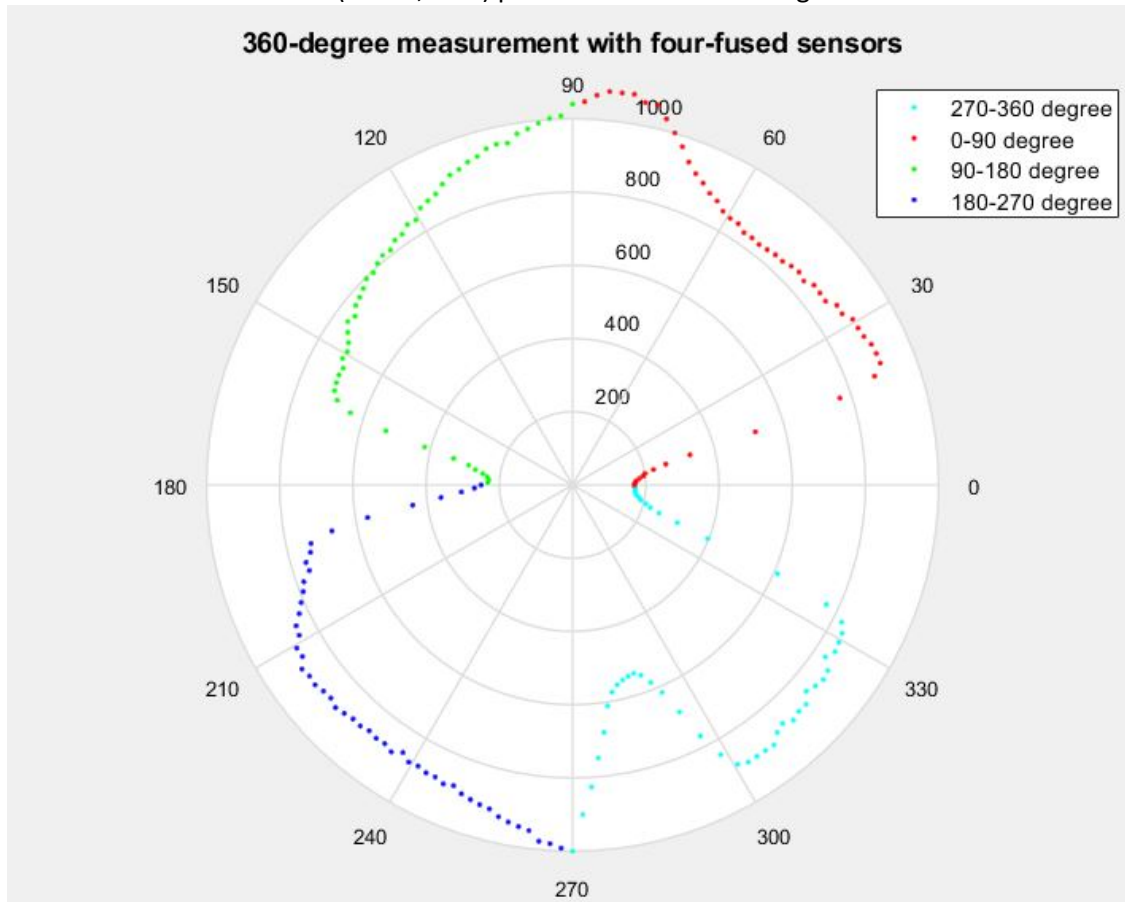
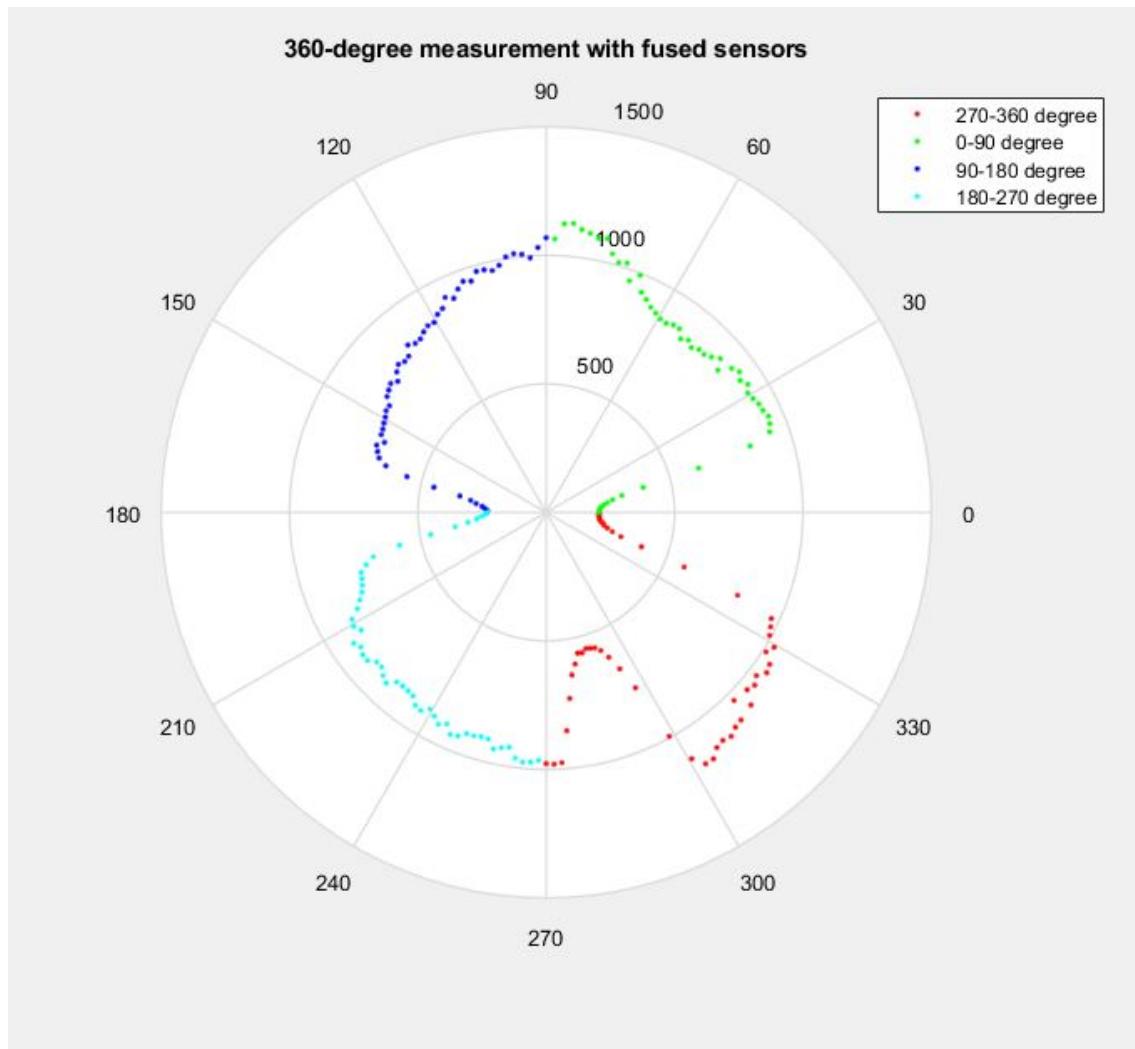


Figure 2 The first measurement under fluorescent illumination (similar to the case in Cultural Convention Center.)

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From the figure 2, the peak for the cylinder with 10 cm diameter is measured at (186mm, 0 mm) and the peak for cylinder with 5 cm diameter is measured at (220mm, 0 mm), which results in app. %3 error. To test the effect of the sunlight exposure, we took the same measurement under direct sunlight illumination. The result is shown in figure 3.



*Figure 3 The first measurement under direct sunlight illumination*

At this point, the peak of the left cylinder is at (215mm, 0mm) and the peak of the right cylinder is at (198mm, 0mm). This is expected due to sensor characteristics.

Then, the second measurement was taken at (24 cm, -30 cm) and used to build the resultant map as shown in figure 4. In this figure, the higher portion of the noise does not affect the result significantly. However, for the triangular prism the measurements are shifted. This may occur because of accidental move of the triangular object.

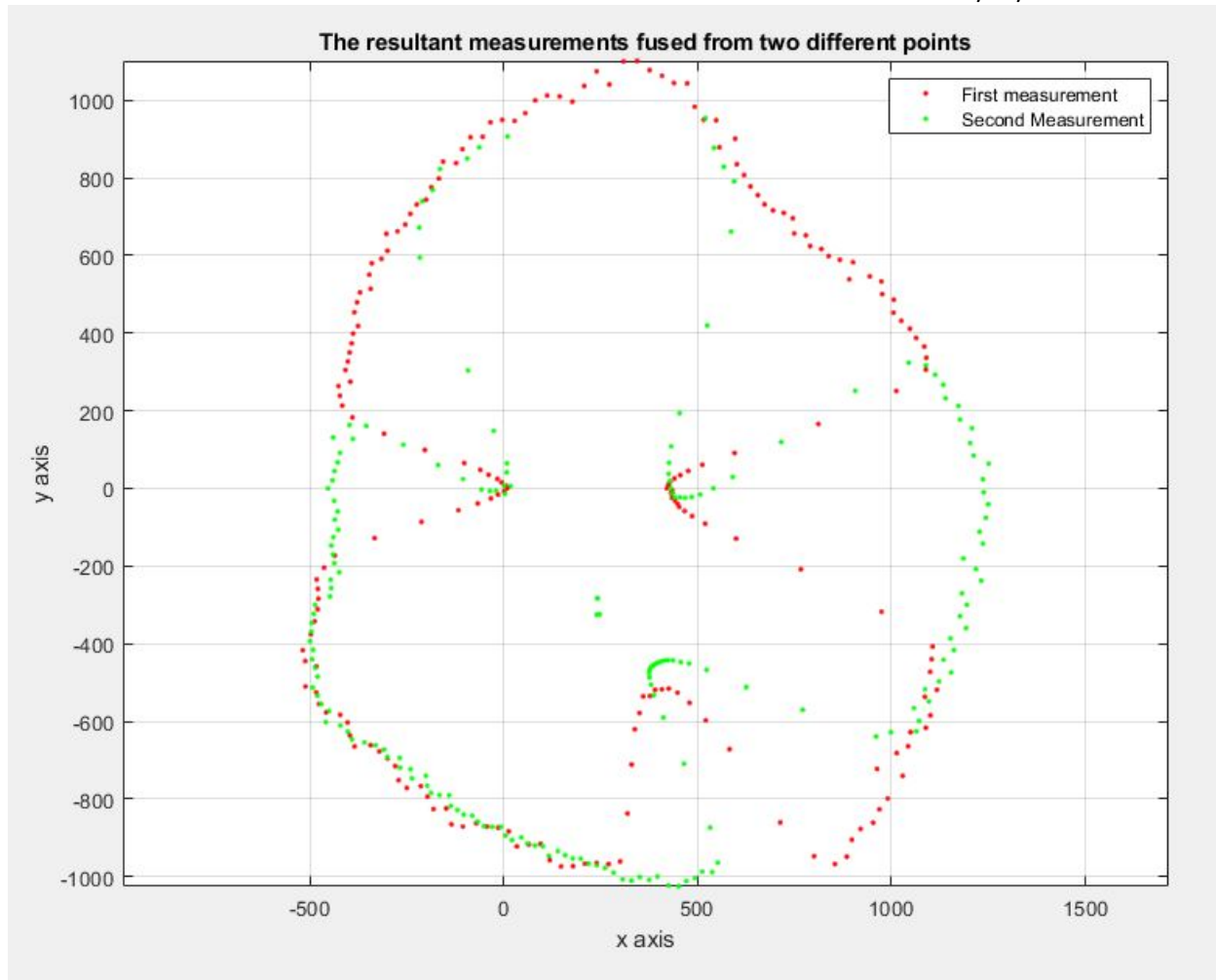


Figure 4 The resultant map

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