Yihao Qian

Team A: Aware

Teammates: Amit Agarwal Harry Golash

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Individual Progress

During the last week, I was in charge of SDK of the camera. I was also in charge of designing and testing the performance of the camera.

<u>Camera SDK</u>

What I did is to learn and rewrite the program using SDK to download the image from the camera. I read through the technical document of the pointgrey camera, learned the function of the camera. The camera can capture the image using the GPIO trigger mode. The camera can also capture the image at a fixed fps and exposure time. Learning how to use the SDK to set the parameter is quite important for our future work.

<u>Camera performance:</u>

I designed two experiment to test the performance (resolution & stability) of the camera.

Resolution: The reason why I designed those two experiment is that we need to use the camera to do the 3-D reconstruction (0-60m). The simply theory behind 3-D reconstruction is that the point in the real world needed to be find in both left image and right image. The higher resolution, the easier for computer to match the point in the two images. I printed the chessboard (resolution 1cm, 2cm,4cm) and tested the camera's resolution.

Stability: The reason why I designed this experiment is to test whether the camera could capture the clear image when the camera is moving in a high speed. Clear image is quite useful for 3-D reconstruction and object detection. We put the camera on a small cart and pushed the cart at around 3m/s. Then try to get the image from the camera. The result shows that when the cart is moving at 3m/s, the camera can't capture the clear image. I believe that's due to the low fps and long exposure time. In the next week, I am going to set the fps as 120, and reduce the exposure time. You may find the blurred image in the figure 1.

Challenges:

<u>Compiling the program</u>

I tried to modify and compile the example code provided by Pointgrey. But when I executed the modified program. The compiled program didn't change. I tried a lot of thing try to figure out what leaded to this problem, such as adding the cout<<"test"<<endl; in the code. The "test" didn't show up when I executed the program.

Working with JP, we finally found out we need to use the sudo ./program_name in order to execute the modified program. Without the ./, the complier would execute the original program instead of the modified program.

Teamwork:

I designed the experiment to test the performance of the camera. Menghan, Zihao, and I tested the performance of the camera. Harry and Amit was in charge of the camera. Harry was also in charge of using the GPIO to capture the image.

Figures:

Figure 1. The final board

Figure 2. The circuit for the force sensor

Plans:

From now on, we are going to build our own perception system.

Harry and Amit will finish the camera housing design and test the performance of the housing in the next week.

Zihao and Amit is going to learn how to acquire some data from the radar.

Harry, Amit and I is going to use the apriltags to calibrate the stereo vision.

The potential challenges in the future is as follow:

We haven't test the performance of the camera in strong sunlight environment. However, according to the weather report, Pittsburgh is going to be cloudy in the next week. We are afraid that may delay our progress.