Assignment 5

The individual part of this assignment was about implementing the propagation model of a particle filter. I did the particle filter experiment with two basic behavior from assignment 4 as mentioned in the description.

My Implementation:

I have implemented the particle filter propagation step assuming both the translation and rotation noise as a independent normal distribution with mean 0, and some suitable variance (from general idea from previous experiments)

```
default_random_engine lgenerator(234254);
default_random_engine agenerator(412356);
normal_distribution<double> linearErrorModel(0.0,0.006) ; //(mean,var)
normal_distribution<double> angularErrorModel(0,0.0002);//(mean,var)
```

Propagation:

I initialized the experiment with 20 particles and propagated along the time stamps based on the velocity command which stored in a bag file. I want to mention that I did not implement the resampling part. The propagation was done just with vector rotation and translation.

Experiment 1 (translate 5 meter):

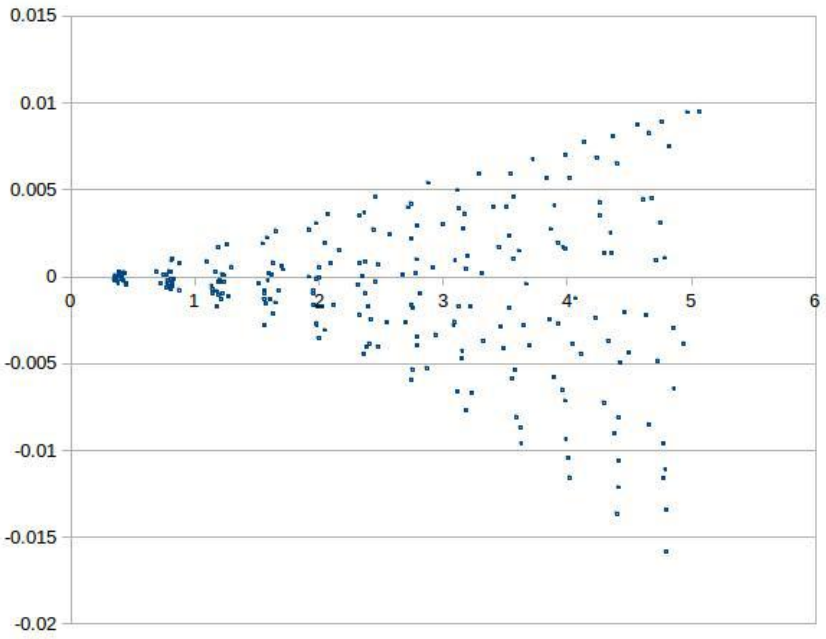

Fig: Particles in a 5 meter translation experiment

Experiment 2 (1 square meter move):

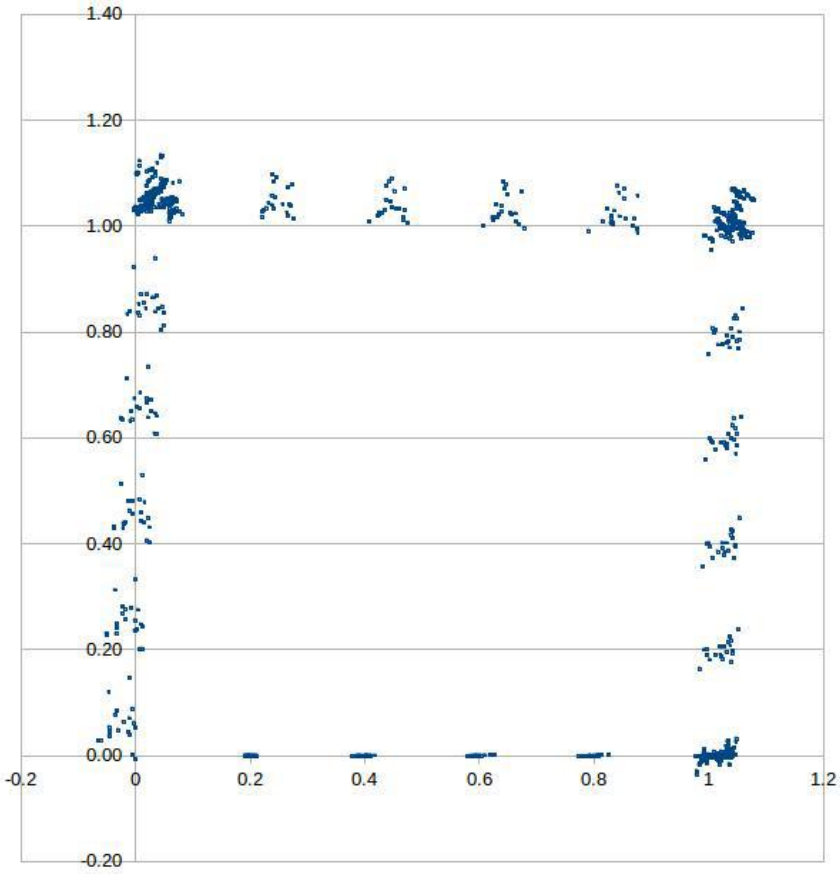

Fig: Particles in 1 square meter move experiment.

Analysis:

I pretty much got the results I expected. For the translation I kind of expected the banana shape, and I believe I did not get it because I have less number of particles and did not do the resampling.