EL2320 Applied Estimation

Project Description

Jingsheng Chen<jinch@kth.se>

In this project, our group plans to Implement EKF-SLAM algorithm.

In the task of Lab1, we use the EKF to estimate the race position of the robot, but the estimated position at this moment is relatively large, and thus we cannot simply rely on robotics to estimate robot location information. After using the robot's motion equation, we can correct the location of the robot using the surrounding environment information obtained by the ranging unit. The above correction process is generally achieved by extracting environmental characteristics and then re-observing the position of the characteristics after the robot movement.

We plan to add some landmarks to the simulation environment, and simulate a robot with two wheels, the robot can use the two wheel differential speed for steering. The robot can locate through the landmarks in the environment and complete the movement on the specified trajectory.

In this Project, we will mainly complete a few tasks:

1. The construction of the simulation environment
2. Implementation of EKF-SLAM code
3. Thinking and summarizing the problems and phenomena encountered in the implementation process

Regarding the construction of the simulation environment, we may use MATLAB, in-depth in the environment given by Lab 1&2, or we'll find a more suitable simulation environment.
If time is permitted , we may also use ROS and complete the simulation in gazebo, since this looks better.