

ABSTRACT

The development of Mobile Robot Navigation developed very rapidly, which now has been implemented cars without driver by detecting accurate objects so as to minimize collisions. Simultaneous Localization and Mapping (SLAM) is one of the areas of research in the field of robotics and artificial intelligence. SLAM is used by Mobile Robots to build maps of areas that are being explored, where the area is not known beforehand.

In this Final Project realization and analyze Rao-Blackwellized Particle Filter (RBPF) algorithm, which is used to estimate the environmental map and estimate the position of the robot relative to its environment, on Turtlebot. The operating system on the robot using Robot Operating System (ROS). By utilizing ROS as a basis, the operating system functions as a robot navigation system that maps in real time and drive the robot and conduct environmental mapping and estimate the position of the robot on the environment.

The result of the analysis showed the relationship between the accuracy of the RBPF algorithm with the number of particles used. Based on the analysis we found that more the number of particles used, the more accurate the maps are obtained but with a longer processing time.

Keywords: SLAM, RBPF, Turtlebot, ROS