

Map Generation for an Autonomous Mobile Robot by Using Laser Range Finder

S. M. A. Arachchi^{1,2}, T. Emaru¹ and P. Rowe²

¹Laboratory of Robotics and Dynamics, Graduate School of Engineering, Hokkaido University, Japan

²Bioengineering Unit, Faculty of Engineering, University of Strathclyde, Glasgow, United Kingdom

The purpose of an autonomous mobile robot is to operate without human intervention in the real world environment. A model of the surrounding physical environment of the robot; i.e a map is needed in order to execute meaningful tasks. This paper explains the techniques required to build a map for an autonomous mobile robot. A laser range finder was used to scan the surrounding environment, where the robot base moved around in a room. Iterative Closest Point method was applied to update a global map and to calculate a local map for the position of the robot. By using the data, distance to objects in the surrounding environment could be obtained in real time.

Therefore this map details could be used by the robot to identify its surrounding environment. Maps are obtained in Cartesian coordinate frame. This method can be used in indoor operated wheel chairs or mobile robots to reach their desired location precisely and by avoiding the obstacles in the surrounding environment.

Key words: Mapping, Iterative closest point method, Laser range finder