

ABSTRACT

In the 21st century, human work is made easier by the presence of robots, many dangerous industrial jobs such as lifting heavy loads, working in dangerous places and others, can be trusted by robots. The movement of robots in the industry is usually only stationary or stays in place and moves the robot's arms such as installing screws, holding loads, etc. But sometimes mobile robots are also applied in industry to deliver goods to a warehouse. Mobile robots are robots that can move from one place to another manually or autonomously.

Thus, in this research, an autonomous mobile robot will be created. The mobile robot in this study can navigate and avoid obstacles in its path of the mobile robot. This mobile robot is equipped with global sensors, namely a GPS module, which works to determine the coordinate position of the robot, its destination, and the coordinates of obstacles. An autonomous mobile robot requires a control system to move to reach the destination coordinates, the control system used in this study is CLBF or Control Lyapunov-Barrier Function, which is a combined control function of CLF or Control Lyapunov Function and CBF Control Barrier Function. In this study, it is expected that the mobile robot can navigate so that the mobile robot can run from the starting point to the destination, and can avoid obstacles on the path of the mobile robot so that the mobile robot can reach its destination safely and not hit obstacles.

The result of this research is that the mobile robot can avoid the unsafe state that has been determined and can run from the starting point to the predetermined point. With accuracy in the first experiment is 96.93%, then for the second experiment that is 91.87%, and for the last one in the third experiment that is 97.60%. The average accuracy value of the three experiments above is 95.46%. This percentage of accuracy is obtained from the comparison of the destination point in the simulation with the endpoint of the implementation of the mobile robot.

Keywords: CLBF, Navigasi, *Mobile robot*, *GPS*, *Autonomous*, *Mecanum*.