

ABSTRACT

The Industrial Research and Development Agency (BPPI) of the Ministry of Industry (KemenPerin) said that Indonesia was in second place based on the results of the 2019 McKinsey & Company research with a value of 78% in industry 4.0 in the future which will have a significant impact on the manufacturing sector in Indonesia for several years. The Head of Robotics & Discrete Automation (ABB) Indonesia explained that in 2017 the absorption of robots in Indonesia was only around 950 units per year. But in 2018 it jumped to 1,200 robot units per year. With that, there is an increase of 20 percent and at the same time it is a sign that robots can be implemented by Indonesian industries. So that when the industry increases, the number of robots needed also increases.

Control Lyapunov-Barrier Function (CLBF) is a control method used in this final project. This method is a combination of the Control Lyapunov Function (CLF) and Control Barrier Function (CBF) methods. Each has a different role, namely the CLF method for system stability and CBF for system security. And waypoint navigation is used as a method to control the direction of motion of the robot so that it can move to the desired coordinates.

The autonomous mobile robot (AMR) in this final project is a mecanum type that can move to the desired coordinates with three waypoints and avoid a predetermined circular barrier object. This final project has a percentage value of 76.47% of successful implementation of the results of the comparison between simulation (Matlab) with real plant implementation in the form of position values to the x-coordinate and y-coordinate.

Keywords: *autonomous mobile robot, control lyapunov-barrier function, waypoint navigation.*