

## **ABSTRACT**

*There are limitations on physical and mental abilities, people with disabilities have the possibility to use a wheelchair to help their movement [1]. There are generally 2 types of wheelchairs, including manual wheelchairs and autonomous wheelchairs. A manual wheelchair is a wheelchair whose movement is still assisted by others in pushing a wheelchair or a manual wheelchair can be moved by turning the wheels on the right and left of the wheelchair. Meanwhile, an autonomous wheelchair is a wheelchair whose movement is assisted by a joystick-shaped controller where users can freely move the wheelchair from one place to another. This autonomous wheelchair has not yet become fully autonomous because the autonomous wheelchair in its displacement is still controlled by the controller, which means that the wheelchair feature can run independently according to navigation [2]. To fulfill this feature, the first part needed is a mapping system. Mapping system is a system of depicting or reading from the surface of an object which is reduced by using a scale to present the size of the map drawn with the actual map size [2]. To get a depiction of the surface of an object, it is necessary to have a sensor that can read the surface of an object. One of the sensors that can describe the 2-dimensional mapping system well is the LiDAR sensor.*

*In a mapping system it is usually expressed using parameters of distance, angle and the values of  $x$ ,  $y$ . In previous mapping system research, the mapping system had parameters in the angle reading of 00 to 0.50 at a distance of 0 - 1500 mm [3]. In this mapping system research, a mapping system will be made with the measurement of a measuring distance of 1 meter to 5 meters in an angle reading of 0, 45, 90, 135, 180, -45, -90, -135, -180. In this study, the LiDAR sensor will be placed at the center point of a room in a stationary state and not moving so that the room mapping system is able to describe a map of the room as a whole through the help of the Robot Operating System framework then displayed through the Rviz software. The input for map creation comes from the distance and angle values of the LiDAR sensor reading.*

*The results of this study are the obtaining of a 2-dimensional mapping system in a closed room, along with distance values in meters and angles in degrees with the error value as much as 0.99 % prove that the LiDAR sensor is a sensor that can function properly and is applied to autonomous wheelchairs.*

***Keywords: LiDAR Sensor, Mapping System.***