ABSTRACT

Lately, the development of robotic technology more attract researchers attention. Until now, various types of robots have been developed. One of robot's type that is being widely discussed is Underwater Robot. Generally, Underwater Robot divided into two types, namely Remoted Underwater Robots and Autonomous Underwater Robot. Remoted Underwater Robot is an underwater robot that it's movements are controlled directly by humans using the remote control. While Autonomous Underwater Robot is able to move in the water automatically without any human intervention.

One thing that is important in Autonomous Robot is a navigation system that can make the robot move by itself in accordance with a program that has been implanted. In this research, there are some points of the navigation have been made, they are orientation that decide which way the robot is facing, the speed of the robot while moving forwards, maneuver to the left or right or rotating to change direction, and determine the position of the robot. In this navigation system, it use a sensor Inertial Measurement Unit or abbreviated IMU which is an electronic module that can generate the data of angular acceleration and linear acceleration. The data obtained from the IMU sensors are processed to obtain orientation, velocity and position of the robot. Then, these data become a reference for Autonomous Underwater Robots in navigating automatically.

In this final project has been made a navigation system based on inertial measurement units that can guide the robot to follow a given path. From the tests, the measurement of orientation of the system obtained an average error of 0.3 degrees for the orientation of pitch, 0.53 degree for roll orientation and 1.12 degrees for yaw orientation. While the measurement of position obtained an average error of 11 cm with a maximum path length testing is two meters. From the navigation system test, with a given path that consists of four straight lines that form a square with a total path length of 20 meters, the system obtain error of the last position of robot to the end point trajectory at 1.35 meters.

Keywords *: Autonomous Underwater Robot(AUV), Navigation, Inertial Measurement Unit*