

ABSTRACT

Unmanned vehicles have begun to bloom in the midst of this rapid technological advancement. Technological developments in the military have become more sophisticated. Autonomous robot has been developed to support the defense and security of a region. Including unmanned vehicles that currently have varied areas of operation, such as in the water, there are USV (Unmanned Surface Vehicle) or unmanned vehicles operating on the surface of the water. To support the operational effectiveness of USV, it is necessary to make a system that works like a manned vessels, like an artificial intelligence implanted to USV can form a formation to confront and pursue targets.

In this thesis, the author uses the method of swarm robotics. This method is implemented in each USV to move with its own decisions in search for targets and stay connected with the friend boat. This method is intended for make formation with a USV that will be the leader for other USVs by taking into account the position for each followers. In order to stay connected with the friend boat, Radio Frequency (RF) communication is used. This RF, send data formation from leader to each followers which will be processed to determine the position of each boat with a particular formation, then each followers will send back a signal to leader that, they are in the right position.

As a result of this research is to created Swarm Robotics with three USV as members that communicate with each other. This commonly called *Swarm Boat*. Each member of swarm boat occupies a predetermined position and form a formation. From the experimental results, it is obtained that time to form a triangle formation is 30.04 seconds, parallel formation is 30.18 seconds, and line formation is 30.28 seconds. For each USV's distance during the formation takes place is 70 cm.

Keywords : USV, Autonomus Robot, Swarm Robotics, Radio Frequency (RF) Communication.