

ABSTRACT

Andi Fridoni Silalahi, Bachelor Degree Majoring in Physics Engineering, Faculty of Engineering, Telkom University, February 2014, Design and Implementation of Fuzzy Logic Control to Control Hover Stability on Autonomous Quadcopter, Guidance Lecturer: Drs. Suwandi, M.Si. as Guidance Lecturer I and Reza Fauzi Iskandar, S.Pd., M.T. as Guidance Lecturer II.

Quadcopter as a type of unmanned aerial vehicle (UAV) is an aircraft without on-board human pilot which has four rotors. There are 3 movement of quadcopter: vertical, horizontal, and maneuver. One of critical condition that accident frequently happened is caused by hover. In a good hover, controller is required to control rotors in x axis (roll), y axis (pitch), z axis (yaw), and high-altitude.

Stabilization controller provides PWM signal to control speed of four rotors. The controller that be used is fuzzy logic control. In controlling attitude roll, pitch quadcopter, the response of system generate error value ± 8 degree. In controlling attitude yaw quadcopter, the response of system generate error value ± 23 degree/second, whereas for altitude the response of system generate error value ± 70 cm with gives 6 second settling time.

During experiment with all of control system on autonomous hover, the experimental responses are different from individual control system. It was caused by noise and unreachable of microcontroller to accomplish all control system simultaneously. Autonomous hover experiment generate high responses error: error roll ± 14 degree, error pitch ± 16 degree, error yaw ± 15 degree/second, and altitude ± 70 cm.

Keyword : Quadcopter, hover, roll, pitch, yaw, altitude , PWM, fuzzy logic, and error.