ABSTRACT

Aero Robot likes Unmanned Aerial Vehicle (UAV) is increasingly popular among researchers around the world for its flexibility and ability to perform a mission, as did surveillance on the border, taking aerial photographs in remote area, the identification of damage the disaster area, an others. The main advantage of the UAV is able to reach areas that difficult and dangerous without endangering the lives of pilot like quadrotor. There has been much research on quadrotor in Indonesia's University, but most still use modules and difficult to modify.

In quadrotor takes an electronic device that measures and reports speed, orientation, and gravitational forces with a combination of accelerometer and gyroscope in Inertian Measurement Unit (IMU), which has 6-DOF (Degreee of Freedom) that the 3-axis accelerometer and the 3-axis gyroscope. IMU is the main component of the inertial navigation system used in aircraft, spacecraft, and unmanned aerial vehicle (UAV). This is commonly referred to as Flight Controller. This is commonly referred to as Flight Controller is not buying so and can be simply modified.

Therefore, it takes a device that can be used to measure, report, and perform attitude control in order to make balancing the quadrotor. The solution is to design and implementation of a flight controller. In this final study done by combining accelerometers and gyroscopes with Quaternion Filter for balancing attitudes quadrotor using Takagi Sugeno Fuzzy Logic Control for the parameter consistency quadrotor stability angle of pitch or roll attitude. Every subsystem are functioning properly, but the quaternion output can not be input FLC for it's instability, so that the system can not be implemented in its entirety.

Keyword : Inertial Measurement Unit, accelerometer, gyroscope, UAV, quadrotor, Flight Controller , Fuzzy Logic Control TS, Quaternion Filter