

Waypoint Navigation of Quad-rotor MAV

Goh Ming Qian, Dwi Pebrianti, Yee Woon Chun,
Yong Hooi Hao

Faculty of Electrical and Electronics Engineering
University Malaysia Pahang Campus Pekan,
26600, Pekan, Pahang.
gohmingqian@gmail.com
dwipebrianti@ump.edu.my

Luhur Bayuaji

Faculty of Computer Science and Software Engineering
University Malaysia Pahang Campus Pekan,
26600, Pekan, Pahang.
luhurbayuaji@ump.edu.my

Abstract–Quad-rotor Micro Aerial Vehicle (MAV) is a multi-rotor MAV with 4 propellers which propel the MAV up to the air and move around. It has high maneuverability to move around, such as roll, pitch and yaw movements. However, line of sight and radio control effective range are the major limitation for the MAVs which significantly shorten the travel distance. Therefore, we proposed a waypoint navigation quad-rotor MAV based on PID controller in this paper. User can set mission with multiple waypoint and the PID controller to control MAV autonomously moving along the waypoint to the desired position without remotely controlled by radio control and guidance of pilot. The results show PID controller is capable to control MAV to move to the desired position with high accuracy. As the conclusion, the result of real flight experiment shows that the %OS of designed PID controller for x is 13% while y is 11.89% and z is 2.34%. Meanwhile, steady-state error for all axis are 0%. This shows that the performance of PID controller is satisfied. Hence, the quad-rotor MAV could move to the desired location via waypoint navigation without guidance of pilot.

Keywords: Waypoint Navigation, Quad-rotor MAV, Proportional Integral Derivation (PID)