DESIGN OF LINEAR QUADRATIC TRACKING FOR VERTICAL LANDING OF QUADROTOR UNMANNED AERIAL VEHICLE

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ABSTRACT
Today, the research of Unmanned Aerial Vehicle (UAV) have developed tremendously that cause the rising of demand and its application in various fields such as security, military and other purposes. Quadrotor is a type of UAV with a characteristic of vertical take-off and landing in which this feature allows the UAV to landing on a narrow terrain. However, this feature in quadcopter cause a problem called turbulence. The wind as a result of the propeller rotation is reflected on the surface of the runway and headed back towards the propeller, causing some kind of a power that presses down the quadcopter and make it incapable of rising altitude or even flying. Shortly before landing, where the turbulence effect is still great, the rotor must spin faster to generate more lift power than the power generated by the turbulence. Conversely, if the rotor speed remains the same as when the turbulence effect is still big when the reality is the power from the turbulence decreases, it will cause a rapid raise of altitude. Linear Quadratic Control (LQT) is control system which output tracks a desired trajectory in some optional sense. The controller is used to control the hight of quadrotor to track a signal has been specified. As for the rotation movement, we will use a PID controller to control the angle so that it won’t exceed 0,48 radiant. The result from this experiment is that LQT and PID controller is able to control the output to track the desired input dan maintain the stability of the angle for rotation.

Keyword : unmanned aerial vehicle, quadrotor, autonomous vertical landing, Linear Quadratic Tracking, PID Controller.
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