Quadcopter Trajectory Tracking Control using State-Feedback Control with Integral Action

International Journal of Computer Applications
Foundation of Computer Science (FCS), NY, USA

Volume 168

Number 9

Year of Publication: 2017

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10.5120/ijca2017914539

Abstract

Trajectory tracking of Unmanned Aerial Vehicles (UAVs) is a very challenging and complicated field of research due to their nonlinear and underactuated dynamics. In this paper, a real time trajectory tracking controller is developed for a quadrotor. A state feedback with integral action control scheme is designed for the position controller to ensure that the quadrotor can track the reference position rapidly. The quadrotor dynamic model is established using Newton-Euler formalism taking into account various physical phenomena that can effect its dynamic behavior. NI-LabVIEW based simulation results show that the proposed controller can make the quadrotor tracks the desired trajectory quickly and smoothly with ensuring the stability for roll and pitch angle.

References

1. M. Tarhan and E. Altug, “EKF based attitude estimation and stabilization of a Quadrotor
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18. A. Ryan and J.K. Hedrick, “A mode-switching path planner for UAV-assisted search and
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Index Terms

Computer Science  Control Systems

Keywords

Quadcopter, Realtime, Tracking, Navigation, Trajectory, Modeling, State feedback