

Implementation of a quadrotor UAV

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Abstract—This paper describes the design and integration of a control system that allows the autonomous flight of a radio controlled commercial quadcopter. A mathematical model for the quadcopter is developed, its parameters determined from the characterization of the unit. An external intelligence is integrated to play the role of the flight controller. Sensors are calibrated and added to the platform, then combined within a Extended Kalman Filter to obtain an estimation of the state variables. The control actions are obtained from a proportional-integral control system based on the LQR algorithm.

I. INTRODUCTION

This paper describes the design and integration of a control system that allows the autonomous flight of a radio controlled commercial quadcopter. A mathematical model for the quadcopter is developed, its parameters determined from the characterization of the unit. An external intelligence is integrated to play the role of the flight controller. Sensors are calibrated and added to the platform, then combined within a Extended Kalman Filter to obtain an estimation of the state variables. The control actions are obtained from a proportional-integral control system based on the LQR algorithm. I wish you the best of success.

mds

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II. MODEL OF A QUADROTOR

III. KALMAN FILTER

IV. CONTROL DESIGN

V. SOFTWARE

VI. FLIGHT TESTS

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VII. CONCLUSION

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