

Bi-Directional Tilting Quadrotor

An investigation into the overactuatedness thereof



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Abstract

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The aim of this thesis is to design, simulate and control a novel quadrotor platform which can articulate all 6 Degrees of Freedom by vectoring thrust produced by the lift propellers. To achieve this the air-frames' structure needs to be changed dynamically during flight, namely adding 2 additional axes of actuation about which each lift propeller can be rotated. The introduction of such actuation to what is otherwise a well understood platform results in an over-actuated control problem. The allocation of actuator priority is the primary contribution of this paper with novel elements of non-linear control treatment for UAV airspace platforms.

An indepth simulation environment was constructed around the proposed design afterwhich control algorithms where developed.

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Introduction

1.1 Section

1.1.1 Subsection

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