Linear quadratic methods for the optimal regulator of an unmanned air vehicle

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Abstract

In this paper, we focus our interest on the control the flight of a micro quadrotor. Trajectory following and angle-correction have been achieved using linear quadratic control methods. These techniques lead to a matrix Riccati differential equation that should be solved numerically. In order to solve this equation, we propose exponential integrators methods that provide quantitative improvements compared with other classical numerical methods. Furthermore, some important qualitative properties of the original problem are preserved when these methods are applied.

Key words: Optimal control, linear quadratic method, matrix Riccati differential equation, second order exponential integrators.
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