On page 12 you have written, “The inputs to the quadrotor will be thrust force , roll torque , pitch torque , and yaw torque .”.

Note that the thrust force , roll torque , pitch torque , and yaw torque , are not the true inputs. Actually the inputs are, , . The inputs could be considered to be, . So,



with . Since the above relation is linear,

.

Thus the thrust force , roll torque , pitch torque , and yaw torque , may be considered to be inputs, as the true inputs, , , may be computed from *Ui*, . There are practical limits to the values of the true inputs, , , which must be considered in a real design. In the case of the quadrotor, which has six degrees of freedom, there are four inputs and the system is underactuated.

On page 15 you have written:

The optimal control that minimizes the cost function is given by

Where is the feedback gain and is the solution of the Riccati equation

Please Add:

Under steady state conditions, the above equation for *P* reduces to the algebraic Riccati equation which is solved using MATLAB Eigenvalue decomposition, after it is reduced to a pair of Hamiltonian equation. In steady state, the gain matrix *K* is a constant.

Table

Description automatically generated

Text, letter

Description automatically generated

N/Ns2