A minimum-time obstacle-avoidance path planning algorithm for unmanned aerial vehicles

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We present a new method to determine an unmanned aerial vehicle (UAV) trajectory that minimizes its flight time in the presence of avoidance areas and obstacles. The optimal control problem is numerically solved using the indirect method with a set of penalty functions embedded in a suitable continuation technique [1, 2]. The arising nonlinear boundary value problems are efficiently solved by the code bvptwp.m/twpbvplc.f that uses a deferred correction scheme based on Lobatto formulae [3]. The results obtained by applying the code to both two- and three-dimensional problems describing very involved scenarios, show the effectiveness of the whole procedure.

References

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