Geometric Tracking Control of an Unmanned Aerial Vehicle based on the Moving Mass Concept on SE(3)

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***Abstract*— This paper is focused on presenting the concept of geometric tracking control for a specific unmanned aerial vehicle (UAV) based on the moving mass concept. It has the ability to exploit its dynamic center of mass as a means of stabilization and control. A mathematical model of such system will be given as grounds for developing the nonlinear geometric tracking controller on the special Euclidean group SE(3). It will be shown that the chosen control terms have desirable properties. Finally, Gazebo simulation results for a selected trajectory tracking problem will be presented using a model of an aerial robot consisting of two moving masses distributed in a standard plus configuration.**

I. Introduction

TODO: Introduction

II. Mathematical model

TODO: Mathematical model...

III. Mid-ranging control concept

TODO: Control...

IV. Simulation

TODO: Simulation...

V. Experiments

Experiments...

VI. Conclusion

Conclusions

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