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April 24th, 2021

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I have reviewed the PhD thesis entitled Modern Flight Control System Design and Evaluation authored by Mr Jan Vlk, and have found the originality, complexity, and practical relevance to be of sufficient merit to qualify as the basis for a doctoral degree.

Mr Vlk's thesis is timely, and addresses problems that are gaining considerable prominence from two major trends in aviation. First, the rapid increase in the adoption of unmanned aerial vehicles (UAV) for military and commercial applications. And second, the prevalence of loss of control (LOC) accidents as the leading cause of aviation fatalities -- calling for solutions to augment and assist the pilot in maneuvering aircraft. Whether it is UAVs or addressing LOC accidents in general aviation, an important constraint in developing solutions that are relevant to these trends is the fact that solutions have to rely on low-cost onboard sensors and processing, without the guarantee of radio navigation aids. Mr Vlk's thesis not only offers technology that addresses these dominant trends in aviation, but does so in a way that accommodates the constraints just noted.

There are several noteworthy aspects to Mr Vlks thesis. First, it demonstrates a practical and easily adoptable model-based approach that uses simulation as the means to identify control parameters, as opposed to control laws used in commercial aircraft that are often analytically derived. Given the variation of aircraft in general aviation and commercial UAVs, and the economic constraints that are central to their viability, model-based approaches offer a practical, low-cost method for creating automated control systems. Second, it illustrates how the robustness of a simple linear model suited to a light sport aircraft can be enhanced by incorporating an adaptive system to resolve uncertainties associated with the underlying linear flight control system model. Third, it illustrates a practical pathway to demonstrate compliance with regulatory requirements through a flight-test on a light sport aircraft. The clear chain of contributions -- from a principled control system design process to empirical demonstration of robustness and regulatory compliance -- make the output of this thesis immediately relevant and impactful.

As summarized below, there are a few ways in which Mr. Vlk can enhance the impact of his thesis. It is important to note that these suggestions are optional, minor in nature, and addressable by means of adding a few paragraphs of text:

- Would it be possible to add text to the introduction and conclusion that add a more comprehensive account of the practical contexts where the contributions of this thesis may be relevant -- in particular, areas such as upset prevention and recovery, and assistance in approach and landing either when an LSA pilot is incapacitated or forced landings stemming from engine failures?

- Could there be a little more elaboration on the specific theoretical contributions of this thesis in relation to the state of the art in control system design -- both in terms of solutions employed by aircraft manufacturers as well as recent academic control systems research? In other words, what are the specific theoretical gaps this thesis addresses?

- The future development section in chapter-8 focuses almost exclusively on practical engineering that could build on the contributions of this thesis. Could it also highlight theoretical and scientific gaps that future research might address?

- Would it be possible to link to videos to illustrate the flight test activity synthesized in this thesis? Besides highlighting an impressive and unique aspect of this research in a compelling, and broadly appealing way, it would be an appropriate mix of communication from a multimedia-focused department.

I find the research summarized in Mr Vlk's thesis to be of broad interest, with the potential for immediate impact. It is original, principled, sophisticated, and well motivated. Having met these criteria, I would strongly recommend the acceptance of this PhD thesis.

Please let me know if I can elaborate or clarify any aspect of my review.

Sincerely,

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