



University of Connecticut  
*School of Engineering*

Department of  
Mechanical Engineering

February 18, 2011

Dear Sir/Madam:

I am writing on behalf of University of Connecticut to obtain a FAA COA for the Maxi Joker 3 UAV platform. University of Connecticut (UCONN) is a public university and the flag ship public research university in the state of Connecticut. The Maxi Joker UAV will serve as a research platform to test advanced algorithms for vision based navigation. It will also serve as a platform for graduate research and education.

At first, I would like to introduce myself. My name is Chengyu Cao. I received my Ph.D. in Mechanical Engineering from the Massachusetts Institute of Technology in 2004. I am currently an Assistant Professor in the Mechanical Engineering Department at UCONN. Prior to that, I was a research scientist in the Department of Aerospace and Ocean Engineering at the Virginia Tech.

My research is in the area of dynamics and control, unmanned systems, and flight control. I have published more than one hundred journal and conference papers. I also published one book entitled "Theory of fast and robust adaptation", SIAM, in 2010. The adaptive flight controller we designed was successfully flight tested on a fixed wing MAV build by Brigham Young University. Our control algorithm was also augmented to the piccolo autopilot and successfully flight tested by Prof. Kaminer in Naval Postal Graduate school. In addition, the adaptive flight controller we designed jointly with NASA Langley Research Center was successfully implemented for NASA's Airborne Subscale Transport Aircraft Research (AirSTAR). An adaptive flight control system using our theory flew on a NASA GTM aircraft (T2) on March 24, during the last deployment of the AirSTAR team at Fort Pickett, VA. The flight, number 14 for the aircraft, lasted approximately 16 minutes, with the adaptive controller closing the inner-loop for about 14 minutes. It was reported on the AeroNews.

The UAV platform is based on the Maxi Joker 3 electric helicopter, which is widely used in the radio controlled community and has proved airworthiness. The flight tests will be conducted at Horse Barn Hill farmland located on the campus of UCONN. The platform will also support collaborative research between UCONN and United Technologies Research Center (UTRC).

This application is very important for UCONN's long term research and education goals. We hope our application could be evaluated favorably in a timely manner. Thank you very much.

Sincerely,

Chengyu Cao, Ph.D.

Assistant Professor

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