Asesor: Dr. Gerardo Ramón Flores Colunga

Sinodales: Dr. Carlos Alberto Paredes Orta
(Sinodal Interno, Secretario)

Dr. Fernando Martell Chávez
(Sinodal Interno, Vocal)

Dr. Gerardo Ramón Flores Colunga
(Asesor de Tesis, Presidente)

Tesis: **"DESIGN AND DEVELOPMENT OF AN UAV WITH HYBRID FLIGHT CAPABILITIES"**

Resumen:

This work presents the modeling and control of the transition maneuver of a class of hybrid Unmanned Aerial Vehicle (UAV): the tail-sitter. The modeling considers aerodynamic terms whereas the proposed controller is designed with the aim of achieve a transition flight from hover to cruise mode and vice-versa. The algorithm is designed to be easily coded in a real tail-sitter platform, hence all the assumptions and considerations take into account the usually available states for UAV control. The key idea behind the controller design is the time-scale separation between UAV's attitude and position dynamics. With this in mind, we obtain a desired trajectory for the pitch angle, which is the responsible to achieve the transition maneuver. The controller design is based on Lyapunov's approach and linear saturation functions. Simulations experiments demonstrate the effectiveness of the derived theoretical results. Also, it is presented preliminary experimental results in a Tail-sitter UAV developed at the Perception and Robotics LAB at CIO.