

MODELLING and CONTROL OF a DRONE FOR EVTOL APPLICATION

Supervisors : Ngac Ky NGUYEN (L2EP) and Pierric JOSEPH (LMFL)

Contacts : ngacky.nguyen@ensam.eu
pierric.joseph@ensam.eu



CityAirbus, an eVTOL example

Scientific context:

This internship is proposed in a context of strong development of electric, multi-copter, flying vehicles, also known as “eVTOL” (drones and other urban taxis, see an example below) for the future generation of transportation. This internship **proposes to establish the modelling and the control of a quadcopter or hexacopter drone**. Moreover, **multiphase drives will be considered to increase the functional reliability** which is one of the main challenge for air transportation.

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Master objective :

By using EMR, the first objective of this project is to model and control of a quadcopter or hexacopter drone. Because the use of four or six units of the studied vehicle, different strategies could be proposed to ensure an optimal flight in term of energy consumption. Flying with one unit in faulty condition will be investigated.

Organization of the Master Thesis:

Bibliographic analysis on the subject.

- Modelling and control of a quadcopter using EMR.
- Analysis and optimization of different configurations (4, 6 rotors).
- Possibility of adding dynamic effects (transition from hovering to forward flight).

Keywords:

System Modelling, EMR, Electrical Drives Model and Control, Quadcopter and Hexacopter Drones, Fluid Mechanic.



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