

Group

NUS UAV Team

Supervisor

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Project Title

Universal Control Methodology Design and Implementation for Unmanned Vehicles

Synopsis

This project is aiming to develop a universal control methodology which can be universally applied to unmanned aerial and ground vehicles. Efficient automatic control is one of the most challenging issues for unmanned vehicle development. It is also time- and labor-cost considering the different vehicles' dynamics. As such, implementing a universal and reliable control methodology to diverse unmanned vehicles could minimize the difficulty for control law design and implementation. The candidate is required to

- 1) Assist the colleagues to construct the universal control system;
- 2) Derive and analyze the dynamics of the adopted ground and aerial vehicles, which are developed based on the self-constructed universal control system;
- 3) Propose a universal control methodology for automatic control of the diverse unmanned vehicles;
- 4) Integrate the control methodology into the software system;
- 5) Implement the control law in actual experiments, for one or multiple unmanned vehicles.

Requirements;

1. All of the documentations in website:

<http://diydrone.com/>

<http://baron.flightgear.org/~curt/UAV/MicroGear1/>

2. All of material in current <http://uav.ece.nus.edu.sg>

Nature

Theory implementation, software programming, and initial hardware design.

Pre-requisite

1. Great enthusiasm and hard-working mood;
2. Background knowledge in QNX and Linux operating system;
3. Skill for hardware assembly and C/C++ programming;
4. Background knowledge in rotorcraft and ground vehicle dynamics and control theory;