Helicopter DBF

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Background

A helicopter is a rotor device, which can take off, land vertically, controlled by four operating controls. The collective pitch controller is to change to angle of attack on both blades for a uniform lift. The cyclic pitch which is responsible for the pitch and roll for the helicopter. The throttle that has a main purpose to control the angular speed of the main rotor Lastly, the anti torque control is used to cancel the main rotor torque and change the yaw angle.

Goal & Objective

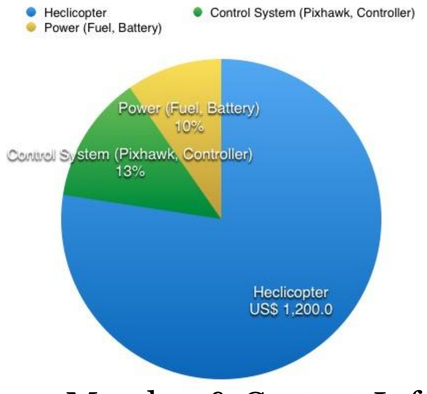
Our goal for the project is to analyze the aerodynamic performance of helicopters for different weight and engine options. In order to determine the optimum helicopter engine option and design for different requireents

Requirement

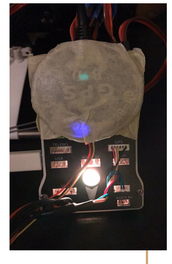
- RC aircraft able to carry around 5 kg of motor, servos, and sensors to conduct the flight as planned.
- Aerial computer system with sensors and communication devices to receive command, execute control inputs, and collect data.
- Ground computer system for flight missions and data collection.

Small helicopter uses battery and motor technology. However, large scope helicopter uses gasoline engine. Our analysis is to find the optimum size and design for electric helicopter or gasoline helicopter.

Budget



The design of the helicopter includes: size, number of blades, span of rotor blade



The optimum design for different helicopter requirements based on aerodynamic analysis will give designer data and suggestions if they want to build a electric or gasoline helicopter for specific usages.

Team Member & Contact Info

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Winter

-Helicopter (prototype and small scale test) assembly
-Circuit design & Remote control flight
-Control system theories

Spring

-Small scale implementation and data analysis
-Prototype test flight
-Aerodynamic Experiment

Simplified Control Loop :