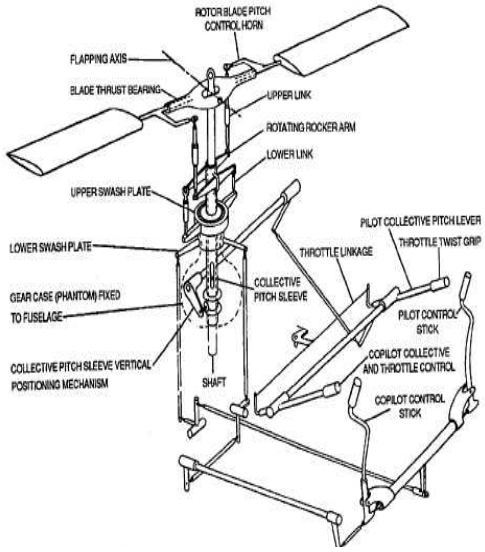
Semesterarbeit / Master Thesis / IDP

Institute of Helicopter Technology

Helicopter Rotor Modeling for Real-time Simulations

Background:

Helicopter rotors are complex systems that are subject to a variety of aerodynamic and dynamic forces. Modeling these rotors accurately is essential for developing and testing helicopter flight control systems and for simulating helicopter flight dynamics. In this research, our dedicated student will utilize MATLAB Simulink to create a highly detailed and accurate simulation of helicopter rotor dynamics for real-time applications. For the mathematical modeling of the rotor dynamics, blade element theory will be examined along with uniform and dynamic (e.g. Pitt-Peters) inflow models.



Through a combination of theoretical knowledge, hands-on modeling, and simulation tools, our student will dive into the world of rotor dynamics. A comprehensive and real-time capable mathematical model that can accurately represent the behavior of helicopter rotors under various conditions will be modeled. Join us in this exciting journey into the world of helicopter rotor modeling, where innovation and precision take flight.

Goal:

The objective of this master thesis is to develop a MATLAB Simulink model of a helicopter rotor that is suitable for real-time simulations. The model will be used to study the effects of various factors on helicopter rotor performance, such as blade pitch, rotor speed, and wind speed.

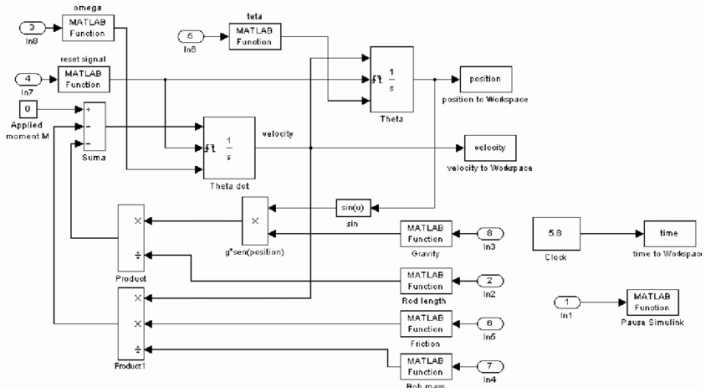
Skills:

Basic understanding of rotor dynamics and experience in MATLAB Simulink.

Tools: MATLAB Simulink

Language: English

Start: As soon as possible



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