Master Thesis

Modeling of Flight Control Kinematics & Actuators of Helicopters

Subject: The subject concerns the creation of detailed models of the kinematics of the flight controls as well as corresponding actuators. Long term target is the simulation of rotor aero-mechanics including structural deformations, flexibility & backlash of the kinematics, external and friction loads as well as transfer function characteristics of the actuators.

Tasks:
- Modeling of the flight control kinematics (1D or multi-body)
- Extension of the model including friction, damping, backlash and elastic flexibilities
- Multi-level modeling of hydraulic and electro-mechanical actuators for flight controls adapted to precision requirements, involved physics (e.g. thermal conduction, power supply) or failure scenarios
- Validation of the models based on literature and experimental data
- Predictive simulation of the performance of the actuation system including selected failure cases

Qualifications:
- Studies of aerospace, mechanical engineering or mechatronics
- Sound knowledge of mechanics (statics and dynamics) and aerospace systems engineering, especially actuation
- Interest in controls, electrical engineering, hydraulics & mechatronics
- Experience in the field of modeling & simulation, preferably Simulink or Modelica/Dymola.
- Excellent analytical and conceptual skills

Date & Location: immediately @ Airbus Helicopters, Donauwörth (Munich area), Germany

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