

Bachelor's/Semester's/Master's Thesis

Development and Implementation of a Motion Cueing Algorithm for a Full Motion Simulator



Description:

Full motion platforms enable realistic flight simulations, essential for testing novel flight controls laws, HMI concepts, and for pilot training. As the platform's actuation is limited, the simulator cannot duplicate the real aircraft's motion. To still create a realistic motion experience, a common approach is to use human perception models (HPM) in combination with motion cueing algorithms (MCA). HPMs model how humans perceive motion. The main goal of the MCA is to determine the necessary platform motion, such that the motion sensed by the pilot resembles the sensed motion the pilot would experience in the real aircraft. The goal of this thesis is to develop an MCA for the Institute's motion platform (see figure above). Recently model predictive control (MPC) and reinforcement learning (RL) have been good candidates for such tasks.

Earliest starting date is February 2025.

Work Packages:

- WP1: Literature research on motion cueing and applicable algorithms
- WP2: Development and implementation of the MCA and HPM in simulation
- WP3: Hardware implementation of applicable algorithms
- WP4: Testing, evaluation, and documentation

Prerequisites:

- Proficient with MATLAB/SIMULINK/SIMSCAPE
- Proficient with GIT
- Very independent working style

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