RESEARCH MASTER INTERNSHIP

Department of Mathematics, Computer Science and Control

Superviser :

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INTERNSHIP DESCRIPTION

Domain : Control

Title : CONTROL OF FLYING IN BACK OF EFFORT

BACKGROUND: In a partnership with RATIER FIGEAC (provider of Airbus cockpit actuators), an experimental bench consisting of two coupled yokes, was implemented at the ISAE. This project aims at acquiring the control of the active technology to replace conventional technologies that generate pilot's feeling on aircraft's flying control devices. Research to date has identified methodologies for the synthesis of control laws in order to adapt the mechanical impedance of the yokes.

OBJECTIVE: The haptic technology (ie force feedback) seems to offer interesting perspectives to improve and "enhance" sensations of flight. Although there are few researches in aviation, the pioneering works in the fields of robotics and automotive show that the dynamic modification of impedance gives a better control to the driver. The objective of this master internship is to apply these principles to control dynamically the impedance to improve pilot's skills (eg: to prevent pilot induced oscillation). Several types of sensations (vibration, stumbled artificial hardening pulses.) have to be considered to assist dynamically or prohibit yoke movements. Thus, it is expected that the candidate:

- Develops a very simplified simulator flight, coupled with the test bench and Matlab/simulink.
- Implement solutions to dynamically adjust the impedance of the yoke according to the pilot action.
- Conduct experiments to validate the concepts.

20 % Theoretical Research	50 % Applied Research	30 % Experimental Research

Possibility to go on a Ph.D.: No

APPLICANT PROFILE

Knowledge and required level:

Control, Matlab/Simulink,
Haptic interface, feedback control

Applications should be sent by e-mail to the supervisor.