POLITECNICO DI MILANO

PhD in INGEGNERIA AEROSPAZIALE / AEROSPACE ENGINEERING - 38th cycle

PNRR_352 Research Field: INTEGRATED AIRCRAFT / FLIGHT CONTROL SYSTEM DESIGN PROCESS

Monthly net income of PhDscholarship (max 36 months)
€ 1400.0 In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity	
Motivation and objectives of the research in this field	Funded by PNRR M4C2 (dalla ricerca all¿impresa) Contributes to M1C2 (digitalizzazione, innovazione e competitività nel sistema produttivo) High performance and optimized aircraft development requires a high degree of integration and a multidisciplinary design approach, the development of which is still an open problem in many fields of engineering. Specifically, the maturity of an integrated aircraft development process is a key factor in determining its performance in demanding tasks such as the ones typical of rotorcraft systems. The objective of this project is to define an integrated development process encompassing both bare aircraft and Flight Control System (FCS) design for rotorcraft. The scope of this project embraces: analysis and specification of Aircraft level requirements driving Aircraft/FCS integrated design (e.g., stability, controllability); specification of feasibility constraints for FCS to meet A/C level requirements; definition of overall design process including bare aircraft dynamics and flight control system.
Methods and techniques that will be developed and used to carry out the research	The candidate will first develop the skills required to perform the project, building on pre-existing competences of control theory and control engineering, flight dynamics, aeroelasticity, and the related mathematical

	methodologies.
Educational objectives	The candidate will develop skills in control theory and control engineering, flight dynamics, aeroelasticity, aaeromechanics, multi-disciplinary optimization, computational methods, and in general in all disciplines that characterize the dynamics and control of advanced vertical take-off aircraft. In addition, by working in a mixed and vibrant academic and industrial context, the candidate will have the opportunity to learn on the job several transferable skills, including communication skills, team working, leadership, ethical aspects associated with the use of innovative technologies. In support of this, the PhD School of Politecnico di Milano provides a complete and rather diverse offer of courses. Each candidate must include in their syllabus at least 10 ECTS in transferable skills, to complement at least other 5 ECTS in technical disciplines associated with Aerospace Engineering, for a total of at least 20 ECTS.
Job opportunities	The candidates will find natural opportunities in the national, European and worldwide aerospace industry in a sector that promises strong expansion and therefore requires strong competitiveness to maintain the top-level role that the national industry currently occupies. However, they may also find opportunities in numerous other high-tech industrial fields, in which competences in dynamics, control, aeromechanics and optimization, as well as experience gathered in the integrated design of complex systems play a fundamental role, centered on but not limited to industrial engineering.
Composition of the research group	1 Full Professors 0 Associated Professors 1 Assistant Professors 5 PhD Students
Name of the research directors	Prof. Marco Lovera

Contacts
Dipartimento di Scienze e Tecnologie Aerospaziali - Politecnico di Milano Via La Masa 34, 20156, Milano - Italy +390223993592 - email: marco.lovera@polimi.it - web site: www.aero.polimi.it

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	700.0 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	Leonardo Helicopters
By number of months at the company	6
Institution or company where the candidate will spend the period abroad (name and brief description)	Delft University of Technology
By number of months abroad	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
The PhD candidate will receive a desk and a personal computer, if needed. Apart from the compulsory ones, the PhD candidate will have the opportunity to follow additional courses, to receive economic support to attend summer schools and participate in conferences. There will be the possibility of paid teaching assistantship.