POLITECNICO DI MILANO

PhD in INGEGNERIA MECCANICA / MECHANICAL ENGINEERING - 38th cycle

Research Area n. 2 - Sustainable Mobility

PNRR_352 Research Field: MATHEMATICAL, PHYSICAL AND NUMERICAL MODELS OF OPTIMAL CARBON BRAKES FOR HIGH PERFORMANCE VECHICLES

Monthly net income of PhDscholarship (max 36 months)
€ 1325.0 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	With reference to DM 352 dated 9-4-2022, the PhD researcher objectives will address the Missions 1 and 4 of the National Plan for Restart and Resileince - PNRR (Piano Nazionale Ripresa e Resilienza). Mission 1 of PNRR focuses on digital transition and competitivity of productive chains. The PhD researcher will aim to develop digital twins to compute efficiently the active safety performance of high-performance road vehicles, reducing stopping distances. Mission 4 of PNRR focuses on filling the gap of education and fostering technology transfer. The PhD researcher will aim to become expert in the field of computational multi-physics systems and become team leader thanks to acquired soft skills during secondments at company sites.
Methods and techniques that will be developed and used to carry out the research	High performance computing is needed to deal with digital twins of complex mechanical and multi-physics systems. The aim is to avoid as much as possible time domain simulations that are often too time consuming and do not allow an insight into phenomena. The candidate will study advanced computational mechanics techniques spanning from FEM to CFD. He/she will rely on artificial intelligence techniques (supervised learning) to define efficiently and in a reduced time the best engineering solutions for mechanical and multi-physics systems.

POLITECNICO DI MILANO

Educational objectives	Hard skills: computational Multiphysics systems, artificial intelligence for quick computations and optimization Soft skills: team leadership, problem solving, dissemination, communication and outreach activities, networking, research fund procurement and management
Job opportunities	Our last survey on MeccPhD Doctorates highlighted a 100% employment rate within the first year and a 35% higher salary, compared Master of Science holders in the same field.
Composition of the research group	2 Full Professors 2 Associated Professors 1 Assistant Professors 5 PhD Students
Name of the research directors	Prof. Massimiliano Gobbi, Prof. Gianpiero Mastinu

Contacts
Phone: +39 02 2399 8289 / 8214 *Email:* gianpiero.mastinu@polimi.it, massimiliano.gobbi@polimi.it phd-dmec@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	662.5 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	Brembo S.p.A.
By number of months at the company	6
Institution or company where the candidate will spend the period abroad (name and brief description)	University of Cranfield
By number of months abroad	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Financial aid is available for all PhD candidates (purchase of study books and materials, funding for participation in courses, summer schools, workshops and conferences) for a total amount of euro 5.401,42.

Teaching assistantship: availability of funding in recognition of supporting teaching activitiesby the PhD candidate. There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.