CIVIL AND ENVIRONMENTAL ENGINEERING

DIATI - Infrastructures, transport systems and civil works

Funded By	Dipartimento DIATI
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Contact	
Context of the research activity	- Planning, design and operation of innovative transport systems and services, with related mobility and logistics scenarios - Analysis of travel attitudes and behaviours, travel demand and mobility styles - Mobility-related dataset analysis and knowledge discovery (from travel surveys, GPS loggers, smartcards, sensors) - Modelling and simulation of traffic flows, rail services, safety issues - Energy-related and environmental sustainability issues of different transport modes - Operational effects of road geometrics and related safety issues - Human factors in simulated and naturalistic driving environments - Advanced rural highway and urban street design - Characterization of unbound, stabilized, and recycled granular materials - Analysis and design or road and airport pavements - Advanced characterization of bituminous binders and mixtures - Use of recycled materials in road construction - Development of nano-reinforced materials for paving applications - Analysis of the static behaviour of underground works constructed in soils and rocks - Study of the behaviour of the support and reinforcement structures in underground works - Analysis of the rock-tool interaction behaviour of the mechanized excavation - Modalities of excavation and building of underground infrastructures - Reduction of natural risks threatening road infrastructures - GNSS positioning, inertial positioning digital photogrammetry and GIS - Mobile mapping systems based on integrated geomatic sensors for full 3D data collection - Integrated geomatic sensors for monitoring of territory, structures and infrastructures - Air quality and pollution assessment systems at different scales and in different scenarios - Indoor/outdoor assessment in living and occupational environments.
	The research program will start by identifying one specific research topic within the above listed ambits (or across more than one ambit). The selected topic will have to be of interest both on a scientific and on a practical

Objectives	viewpoint and in line with the research activities carried out within the DIATI department. According to the overall objectives of the Ph.D study program in Civil and Environmental Engineering, the goal of the research is to advance the state of knowledge in the chosen field through some significant scientific contribution. Such original contribution should be based on the development of a thorough analysis of the state of the art and on a sound elaboration of new theoretical knowledge that is supported by empirical evidence. This latter should be gathered through experimental activities carried out during the research, both on field or in the laboratories of the DIATI department.

Skills and competencies for the development of the activity	According to the specific topic of the research activity, candidates should have a degree in civil engineering, environmental engineering, traffic and transportation engineering, mechanical engineering, building engineering, electronic or computer technology engineering, management engineering, applied mathematics, statistics, physics, land use planning, regional studies or quantitative methods in social sciences. Previous knowledge of calculus and statistics are also sought, along with some basic research experience related to the selected Ph.D. topic, including but not limited to the work done during the M.Sc. or M.Eng. thesis. Both the examination of the curricola and the oral interview will be aimed at assessing the potential of the candidates to develop an innovative research activity leading to outstanding scientific accomplishments.