ARTIFICIAL INTELLIGENCE

DM629 PNRR/UNIPISA/DISEG - AI-Based Data Registration System for an Advanced Infrastructure Management Platform

Funded By	MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584] UNIVERSITA' DI PISA [P.iva/CF:00286820501] Dipartimento DISEG
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Context of the research activity	The research includes the development of the framework, the adoption of AI algorithms for operational analysis and damage detection, and the integration of real-time data from field sensors and operators. The platform will update digital models, visualize data, and include lifecycle assessments. A certification process will ensure the reliability of the data. The system will be tested in pilot projects and refined based on feedback, to revolutionize infrastructure management. Progetto finanziato dal PNRR a valere sul DM 629/2024 "Generica di ricerca PNRR" - CUP: E14D24002310006
Objectives	The dissertation project focuses on the development of an AI-powered two-way data acquisition system for infrastructure management that bridges field operators and continuous monitoring systems with an advanced infrastructure management platform. The objectives are to improve data-driven asset management through continuous updates of digital models and real-time visualization, enhance field inspection and maintenance operations using AI technologies, such as automated operation mode analysis and video-based inspections, and to integrate comprehensive data management and lifecycle assessment tools. In addition, a certification process for dynamically collected and processed data will be developed to ensure its accuracy and reliability. This research aims to revolutionize the construction and infrastructure management industry by creating a robust, AI-driven framework for continuous improvement and real-time responsiveness.
	Candidates should have a degree in civil engineering, environmental

Skills and competencies for the development of the activity	engineering, building engineering, or traffic/transportation engineering, aligned with the research topic. Essential qualifications include basic coding knowledge in MATLAB and Python, GIS, as well as a keen interest in developing advanced skills in implementing numerical platforms integrated with AI approaches, blockchain technology, and smart contracts. This should ideally be demonstrated (in whole or reasonably in part) through work done during the M.Sc. thesis.