

# DESIGN AND TECHNOLOGY. PEOPLE, SYSTEMS, ENVIRONMENT

## DM 118- AI & Digital Twin to achieve digital transformation of infrastructure through innovative assessment of environmental and social sustainability

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| <b>Funded By</b>                        | MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584]<br>Dipartimento DISEG  |
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| <b>Context of the research activity</b> | <p>The research aims to investigate the use of new business methodologies and digital tools Artificial Intelligence and Digital Twin with the purpose of developing an innovative environmental and social sustainability assessment system, to target the digital transformation of infrastructure network management.</p> <p>Progetto finanziato nell'ambito del PNRR – DM 118/2023 - CUP E14D23001600006</p>  |
| <b>Objectives</b>                       | <p>Digital transformation as well as the use of digital technologies like Artificial Intelligence (AI), Machine Learning (ML), Internet of Things (IoT), and Digital Twins (DT) are fundamentally reshaping the way buildings and infrastructure are designed, developed, constructed, and operated.</p> <p>Currently, there is an increasing demand for information management methods and tools that can make building processes more efficient and decisions taken for heritage enhancement and asset maintenance more effective.</p> <p>The objective of the proposed doctoral research is to develop solutions for the management of infrastructure networks through innovative assessments of environmental and social sustainability.</p> <p>The fellowship focuses the analysis on resilience assessment and asset management, specifically focusing on surveying, processing data with ML and AI systems, modeling and managing the information in real time through DT, automating maintenance, and developing a resilience-oriented decision support system for strategic operational planning through the use of up-to-date and easily deployable technologies for infrastructure asset census.</p> <p>This research project aims to develop a technology platform, consisting of an ecosystem of physical and digital components, that can innovatively integrate and make sensors, digital models, and infrastructure networks operable in a native and real-time environment.</p> |

**Skills and competencies for the development of the activity**

The candidate should have knowledge and competencies on:

- knowledge gained on a course study related to building/construction engineering
- Knowledge of methods for the assessment of environmental, economic and social sustainability, particularly through life cycle approaches (LCA)
- Knowledge of Building Process Management and Building Information Management