



# PhD in INGEGNERIA GESTIONALE / MANAGEMENT ENGINEERING - 39th cycle

**THEMATIC Research Field: USE OF BIG DATA IN LOGISTICS FOR THE DEVELOPMENT OF DATA-DRIVEN APPROACHES**

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| <b>Monthly net income of PhDscholarship (max 36 months)</b>  |
| <b>€ 1450.0</b>  |
| In case of a change of the welfare rates during the three-year period, the amount could be modified. |

| <b>Context of the research activity</b>  |  |
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| <p><b>Motivation and objectives of the research in this field</b></p>                          | <p>In the Logistics 4.0 landscape, the increasing adoption of digital technologies enables companies to gather and record detailed data concerning logistics processes. As a consequence, bigger and bigger data sets concerning transportation, warehousing, and other logistics activities are increasingly available. In this context, the development of tools based on Artificial Intelligence (AI) are expected to exploit such data sets to find patterns and provide useful insights, thus improving data-driven decision-making capabilities or even laying the grounds for the automation of some decisions. Therefore, the introduction of AI-based tools is expected to transform existing processes, also changing the role and tasks of managers.</p> <p>The extant literature on the use of AI in logistics systems is relatively scarce and mainly focused on specific applications like inventory management and image recognition supporting robotized picking systems.</p> <p>The aim of this research project is exploring the potential of AI-based applications for big data analytics in logistics systems, highlighting their effects on logistics processes transformation and related performance changes.</p> |
| <p><b>Methods and techniques that will be developed and used to carry out the research</b></p> | <p>The initial phase of the research will encompass a literature review and exploratory case studies/interviews on the use of AI to innovate traditional logistics systems and practices. The second phase will entail the development of models and managerial approaches for</p>   |



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|  | development of models and managerial approaches for logistics systems where AI-based applications are implemented, and then methodologies and tools supporting the design and control of such systems. Tools can include qualitative frameworks as well as analytical models. Collaborative projects with companies are planned with the main aim of retrieving big data sets and validating the proposed models/approaches.  |
| <b>Educational objectives</b>            | <p>The PhD student is supposed to become a researcher with a specific capability to develop data-driven decision-making approaches for the design and management of logistics system. The PhD student should become able to:</p> <ul style="list-style-type: none"> <li>•Understand the promises of AI and its industrial applicability;</li> <li>•Identify and analyze the data-driven decisions in logistics;</li> <li>•Develop new methodologies and tools to support the design and management of logistics systems in the new paradigm.</li> </ul> |
| <b>Job opportunities</b>                 | <p>Logistics engineer in logistics facilities.<br/>                 Logistics data scientist.<br/>                 Logistics manager in logistics services providers and shippers.</p>  |
| <b>Composition of the research group</b> | <p>1 Full Professors<br/>                 2 Associated Professors<br/>                 1 Assistant Professors<br/>                 1 PhD Students</p>   |
| <b>Name of the research directors</b>    | Marco Melacini  |

| <b>Contacts</b>          |  |
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| marco.melacini@polimi.it |  |

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



| Scholarship Increase for a period abroad |         |
|--|---------|
| Amount monthly                           | 725.0 € |
| By number of months                      | 6       |

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

Computer availability, desk availability, software availability.