

Ph.D. Thesis Proposal
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Title: Leveraging Machine Learning Models for Business Process Management

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Description

Business Process Management (BPM) [1] is a crucial discipline that enables organizations to model, analyze, optimize, and automate business processes to enhance efficiency and reduce operational costs.

Advancements in Machine Learning (ML) and more recently in Large Language Models (LLMs) have opened new avenues for intelligent process management. ML-based approaches can analyze vast amounts of event log data, detect anomalies, and make proactive recommendations for process optimization [2].

The aim of this thesis is to explore the application of ML models, deep learning architectures, and LLMs to advance process management by addressing some major research challenges:

- *Context-aware predictive process monitoring*: consider internal and external organizational context (resource overload, period of the year..) to predict outcomes and suggest interventions to improve process effectiveness

- *Heterogenous and multiple objects logs*: overcome current limitations and simplifying assumptions regarding the format of event logs [3,4]

- *Automating the process life cycle (modeling, execution, improvement) with Foundation Models*: leveraging foundation models to minimize user effort in the full process life cycle [5].

References

[1] Marlon Dumas, Marcello La Rosa, Jan Mendling, Hajo A. Reijers. Fundamentals of Business Process Management. Springer 2013, ISBN 978-3-642-33142-8, pp. I-XXVII, 1-399

[2] Dumas, Marlon, et al. AI-augmented business process management systems: a research manifesto. ACM Transactions on Management Information Systems 14.1 (2023): 1-19.

[3] Wissam Gherissi, Joyce El Haddad, Daniela Grigori. Object-Centric Predictive Process Monitoring. ICSOC Workshops 2022

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