Third-year Ph.D Progress Report

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ABSTRACT: During the third year of my Ph.D. studies, my efforts were primarily directed toward two key areas. Firstly, I concentrated on publishing research papers across various venues, focusing on topics related to impact compliance. Secondly, I worked on organizing and consolidating my research for my dissertation. This process involved integrating both my published papers and works that were still under review, as well as aligning my research findings with the overarching framework of my thesis

1 Ph.D. Progress Introduction

In the current phase of my Ph.D., my primary focus has shifted toward submitting papers to various journals and conferences. Over the past year, I submitted four papers to conferences. Two of these papers were accepted at the KES AMITS conference. The TIME conference initially rejected one, but it is currently undergoing revisions for submission to the SAC conference. One was a workshop paper. In addition to conference submissions, I have been working with my research group to submit papers to journals. We submitted two papers: one to *Information Systems*, which aligns closely with my main research focus, and another on defeasible logic, both of them published.

As part of my research process, I actively participate in weekly group meetings for the Knowledge Representation and Applied AI Knowledge Sharing Program. These meetings offer a collaborative space where I regularly contribute ideas and insights, particularly on topics related to my research. This group has been instrumental in refining my work and staying engaged with the broader research community.Additionally, I had discussions with my company collaborator to review the progress and findings of my project. These meetings allowed us to align on key developments, share insights, and ensure that the project remains on track. The collaboration also provided an opportunity to exchange ideas on potential improvements and future directions

Regarding the second point, specifically my dissertation, it primarily focuses on the concept of impact compliance. The core aim of my research is to explore how the notion of "impact" can be integrated into business processes. More precisely, I am introducing a new type of compliance framework—impact compliance—designed to ensure that processes adhere to a set of constraints. This framework verifies whether the negative or undesired effects produced by tasks within a business process remain below specified thresholds. By establishing these limits, the goal is to measure and mitigate adverse outcomes, ensuring that the overall impact of business activities is within acceptable bounds.

In my dissertation, I focus primarily on the agricultural aspect of impact compliance, which aligns with the broader goal of mitigating the emissions of carbon dioxide and other harmful pollutants. The project is centered on developing methods to reduce the environmental impact of agricultural processes, with a particular emphasis on controlling climate change. By integrating the concept of impact into agricultural business processes, the aim is to ensure that emissions and other pollutant outputs are kept below defined thresholds, helping to minimize their contribution to climate change. This research highlights the importance of impact compliance as a means of addressing sustainability challenges in agriculture while ensuring that business processes adhere to environmental constraints.

2 Publication

2.1 Conference Paper

- Data augmentation for Business Process Alignment **(Accepted)**

- AI-Driven Nitrogen Stress Management in Cereal Crops via Drone TechnologyYimer et al. (2024)**(Accepted)**

- Exact and Approximate methods for risk analysis of business processes(**Rejected**).

- Assessing Impact of Climate Change on Mineral-Associated Organic Carbon (MAOC) Using Machine Learning ModelsWorkneh et al. (2024)

2.2 Journal Papers

- Revising non-monotonic theories with sufficient and necessary conditions: the case of Defeasible LogicOlivieri et al. (2024)

- Business Process Compliance with impact constraints Workneh et al. (2025)

References

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