

Bachelor's Thesis

Integration of Sustainability Data into Object-centric Process Mining

Businesses changing their current practices toward more sustainable processes is essential for global development. Process mining describes a set of techniques analysing data on the execution of business processes to improve and manage processes. With this thesis project, you will take an active role in researching the application of process mining to increase sustainability, dive into the realm of object-centric process mining and broaden your knowledge of coloured Petri nets.

The application, development and research of process mining techniques require appropriate event data containing the information required to develop algorithms. In your thesis project, you will work with the state-of-the-art object-centric event log standard and enable the creation of artificial event logs that can be used for research on process mining for sustainability (PM4S). You will create an extension for CPN Tools (a tool for the simulation of coloured Petri nets) to allow the automated integration of emission data to event logs using the API of ClimaTiq. Using your extension, you will simulate an object-centric process to create an event log fulfilling the requirements for PM4S.

Methods and Tools

To develop the connection between CPN Tools and the ClimaTiq API, you need experience in developing in Java and working with Rest APIs. To simulate a PM4S-compliant event log, you must know your way around (coloured) Petri nets, know how to programme functionally and bring a certain degree of creativity. Knowledge of data structures and data formats, especially JSON and XML, will prove useful. For successful completion, strong analytical skills and a high level of motivation are of the essence.

Pointers

- Paper introducing PM4S (<https://www.researchgate.net/publication/370286125>)
- Tool for Simulating Event Logs (<https://cpntools.org/>)
- Current Standard for Object-Centric Event Logs (<https://www.ocel-standard.org/>)
- Emissions database ClimaTiq (<https://www.climatiq.io/data>)
- Process Mining Book (<https://doi.org/10.1007/978-3-662-49851-4>)
- Object-Centric Process Mining (https://doi.org/10.1007/978-3-030-30446-1_1)

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Contact Details

If you're interested or have further questions, feel free to send an email to Nina Graves (graves@pads.rwth-aachen.de). Please include a CV and your transcript of records. I'm looking forward to hearing from you!