Bachelor Project: Stochastic Process Discovery in Python

Process mining aims to enable analysts to obtain insights about business processes running in organisations. Using these insights, the organisation can improve and optimise its processes. Stochastic process mining is a sub-field of process mining that takes the likelihood of behaviour into account. First step in a process mining project is to discover a stochastic process model from an event log, using an algorithm.

In this project, we will extend pm4py [3] by implementing existing stochastic process mining techniques in pm4py:

- First, we will design a data object for stochastic labelled Petri nets in Python, building upon the already implemented Petri nets;
- Second, we will implement import and export routines for these new stochastic Petri net objects;
- Third, we will implement an existing stochastic discovery technique in pm4py, such as [1] or [2];
- Fourth, we can consider more advanced stochastic discovery techniques, such as [4], or improve the stochastic Petri net ecosystem in pm4py with visualisers, editing options, or further computational methods such as [5].

Pre-requisites

To apply for this project, you must demonstrably have experience with process mining. For instance, you have followed Business Process Intelligence or have taken your seminar in the BPM or PADS group.

About the BPM group

The Business Process Management: Foundations and Engineering group is a new group in the Informatik faculty. The focus of the BPM group, led by Prof. Sander Leemans, is on the combination of data-based process analysis and the optimisation of processes in organisations.

How to apply

In an at-most 1-page A4 application, motivate what triggers you to pursue this opportunity, and indicate your prior experience with process mining, including relevant courses and your marks. Please send your application to applications@bpm.rwth-aachen.de. The project starting date is projected at 1 October 2023.

References

[3] https://pm4py.fit.fraunhofer.de/documentation