Master Project: Stochastic Conformance Checking with BPMN

To enhance the operational process outcomes of an organisation, process mining techniques extract information from process executions recorded in IT systems to create a process model, such as a Petri net or a BPMN model. The discovered models provide insights into the processes, including key data, metrics or events that may have otherwise gone unnoticed.

Conformance checking techniques measure the quality of the discovered process model by quantifying the differences between the model and an event log. There are several (stochastic) conformance checking techniques for Petri nets, but such techniques for BPMN models have not been defined.

Recently enriched BPMN models describe the decisions taking place during a process and the likelihood of choices. Therefore, a conformance checking measure for stochastic BPMN models should consider both the control flow and the frequencies of the log and the process model.

In this project, we will:

- Extend the BPMN notation with probabilities and likelihoods for a large set of elements;

- Extend an existing stochastic conformance checking technique to uncover discrepancies between the model and the event log;

- Implement the approach and evaluate it with real-life event data.

Pre-requisites

To apply for this project, you must demonstrably have experience with process mining. For instance, you have followed Fundamentals of Business Process Management, Business Process Intelligence, Advanced Process Mining, 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. Tian Li is a PhD student in the BPM group who focuses on stochastic process mining.

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 starting date is flexible, and applications close 29 March or once a suitable candidate has been found.