Topics for the seminar on process analysis (CS 719, FSS 2023)
Last updated: February 1, 2023

This document provides a list of topics suggested for the literate study. The accompanying topic descriptions provide information about the potential research questions you can aim to answer in your literature study.

**Process mining in education.** Educational process mining is the practice of leveraging tools to discover insights in education, e.g., to gain insights into the learning processes of students or providing tailored advice to students. In this project, you will investigate the different use cases, studies, and techniques for process mining in education.

**Sustainable BPM.** Sustainability is a crucial concern in today's environment. In this project, you will investigate how business process management practices can support and are being used to improve the sustainability of organizational operations.

**Event data extraction.** Having access to the right data is one of the most important inhibitors of process mining. In this project, you will investigate why data extraction is so complicated and what techniques exist to partially ease the pain.

**Stochastic process mining.** Recently, process mining techniques have started incorporating stochastics into their consideration in order to, e.g., deal with uncertainty in the event data or reflect likelihoods. In this project, you will investigate the current usage and potential of such stochastic process mining.

**Automated discovery of business process simulation models from event logs.** Business process simulation estimates process performance under multiple scenarios, providing valuable information for process improvement. In this project, you will investigate the capabilities and limitations of log-based discovery methods for simulation models.

**Time series analysis in process mining.** Time series analysis involves data analysis over time to uncover meaningful statistics and characteristics. In this project, you will summarize the use of time series analysis techniques in the process mining domain and their application in addressing process mining tasks.
Learning rules and patterns from event data. Event data is multi-perspective, with information on activities, execution time, resources, and other attributes. Detecting temporal rules and dependencies between attributes is crucial for understanding process execution. Your task is to review process mining techniques for learning rules and patterns in event data.

Advanced encoding strategies in predictive process monitoring. Predictive Process Monitoring is a branch of process mining that aims at predicting the future of an ongoing process instance, where data encoding plays an important role. In this project, you will investigate the capabilities of the recently developed advanced encoding strategies.

Develop your own topic. You are also free to propose your own topic by looking at publications at key venues such as the international conferences on Business Process Management (BPM), Advanced Information Systems Engineering (CAiSE), and Process Mining (ICPM), as well as journals such as Information Systems and Decision Support Systems. Topics can relate to research areas such as business process management, process mining, process analysis, stream processing, and robotic process automation.