

## Topics for seminar on process analytics (CS 719 & SM 457)

The following papers are suggested papers that can serve as the starting point for the literature survey you shall conduct. You are also free to propose your own topic/paper 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 of interest can relate to research areas such as process analysis, process mining, stream processing, and robotic process automation.

### Process discovery:

1. Shraga, R., Gal, A., Schumacher, D., Senderovich, A., & Weidlich, M. (2020). **Process discovery with context-aware process trees**. *Information Systems*, 101533.
2. A Senderovich, M Weidlich, A Gal. **Context-aware temporal network representation of event logs: Model and methods for process performance analysis**. *Information Systems* 84, 240-254, 2019
3. Camargo, M., Dumas, M., & González-Rojas, O. (2020). **Automated discovery of business process simulation models from event logs**. *Decision Support Systems*, 113284.
4. Anna Kalenkova, Artem Polyvyanyy and Marcello La Rosa: **A Framework for Estimating Simplicity of Automatically Discovered Process Models Based on Structural and Behavioral Characteristics** (BPM'20)
5. Cabanillas, C., Ackermann, L., Schönig, S., Sturm, C., & Mendling, J. (2020). **The RALph miner for automated discovery and verification of resource-aware process models**. *Software and Systems Modeling*, 1-27.

### Conformance checking:

6. Florian Richter, Janina Sontheim, Ludwig Zellner and Thomas Seidl: **TADE: Stochastic Conformance Checking using Temporal Activity Density Estimation** (BPM'20)
7. Artem Polyvyanyy, Andreas Solti, Matthias Weidlich, Claudio Di Ciccio, and Jan Mendling. 2020. **Monotone Precision and Recall Measures for Comparing Executions and Specifications of Dynamic Systems**. *ACM Trans. Softw. Eng. Methodol.* 29, 3
8. Burattin, Andrea, Giancarlo Guizzardi, Fabrizio Maria Maggi, and Marco Montali. **"Fifty Shades of Green: How Informative is a Compliant Process Trace?"** In *International Conference on Advanced Information Systems Engineering*, pp. 611-626. Springer, Cham, 2019.

9. Padró, L., & Carmona, J. (2019, September). **Approximate computation of alignments of business processes through relaxation labelling**. In International Conference on Business Process Management (pp. 250-267). Springer, Cham.

#### **Anomaly detection:**

10. Timo Nolle, Alexander Seeliger, Nils Thoma, Max Mühlhäuser. DeepAlign: **Alignment-Based Process Anomaly Correction Using Recurrent Neural Networks** (CAISE'20)
11. Böhmer, K., & Rinderle-Ma, S. (2020). **Mining association rules for anomaly detection in dynamic process runtime behavior and explaining the root cause to users**. Information Systems, 90, 101438.

#### **Stream-based process mining:**

12. Daniel Schuster and Sebastiaan J. van Zelst: **Online Process Monitoring Using Incremental State-Space Expansion: An Exact Algorithm** (BPM'20)
13. Ahmed Awad, Matthias Weidlich, Sherif Sakr, **Process Mining over Unordered Event Streams** (ICPM'20)
14. Florian Stertz, Stefanie Rinderle-Ma and Juergen Mangler: **Analyzing Process Concept Drifts Based on Sensor Event Streams During Runtime** (BPM'20)

#### **Clustering and abstraction:**

15. Massimiliano de Leoni and Safa Dünder. **Event-Log Abstraction using Batch Session Identification and Clustering** (2020). In The 35th ACM/SIGAPP Symposium on Applied Computing (SAC '20), March 30-April 3, 2020, Brno, Czech Republic. ACM, New York, NY, USA, 9 pages. <https://doi.org/10.1145/3341105.3373861>
16. Lu, X., Tabatabaei, S. A., Hoogendoorn, M., & Reijers, H. A. (2019, September). **Trace Clustering on Very Large Event Data in Healthcare Using Frequent Sequence Patterns**. In International Conference on Business Process Management (pp. 198-215). Springer, Cham.
17. Felix Mannhardt, Massimiliano de Leoni, Hajo A. Reijers, Wil M. P. van der Aalst, Pieter J. Toussaint. **Guided Process Discovery - A Pattern-based Approach** (2018): Information Systems (76) pp. 1-18.
18. Tello, G., Gianini, G., Mizouni, R., & Damiani, E. (2019, September). **Machine Learning-Based Framework for Log-Lifting in Business Process Mining Applications**. In International Conference on Business Process Management (pp. 232-249). Springer, Cham.

#### **Other process mining topics:**

19. Saskia Nuñez von Voigt, Stephan A. Fahrenkrog-Petersen, Dominik Janssen, Agnes Koschmider, Florian Tschorsch, Felix Mannhardt, **Quantifying the Re-identification Risk of Event Logs for Process Mining** (CAISE'20)
20. Camargo, M., Dumas, M., & González-Rojas, O. (2019, September). **Learning accurate LSTM models of business processes**. In International Conference on Business Process Management (pp. 286-302). Springer, Cham.

#### **Process modeling & analysis:**

21. Fabrizio Maria Maggi, Marco Montali, Rafael Peñaloza and Anti Alman: **Extending Temporal Business Constraints with Uncertainty** (BPM'20)
22. Roman Mühlberger, Stefan Bachhofner, Eduardo Castelló Ferrer, Claudio Di Ciccio, Ingo Weber, Maximilian Wöhrer, Uwe Zdun. **Foundational Oracle Patterns: Connecting Blockchain to the Off-chain World**
23. Fahland D. (2019) **Describing Behavior of Processes with Many-to-Many Interactions**. In: Donatelli S., Haar S. (eds) Application and Theory of Petri Nets and Concurrency. PETRI NETS 2019. Lecture Notes in Computer Science, vol 11522. Springer, Cham.  
[https://doi.org/10.1007/978-3-030-21571-2\\_1](https://doi.org/10.1007/978-3-030-21571-2_1)

#### **Robotic Process Automation:**

24. Jin, Z., Anderson, M. R., Cafarella, M., & Jagadish, H. V. (2017, May). **Foofah: Transforming data by example**. In Proceedings of the 2017 ACM International Conference on Management of Data (pp. 683-698).