Type:
Master thesis

Title:
Fairness in Business Process Analysis

Description:
Evidence-based BPM powered by process mining helps to create a common ground for business process improvement and information systems development. The uptake of process mining is reflected by the growing number of commercial process mining tools available today. There are over 25 commercial products supporting process mining (Celonis, Disco, Minit, myInvenio, ProcessGold, QPR, etc.). All support process discovery and can be used to improve compliance and performance issues. For example, without any modeling, it is possible to learn process models clearly showing the main bottlenecks and deviating behaviors. However, such powerful analysis techniques also imply a risk. Responsible Data Science (RDS) is concerned with the dangers of using data. In this project, the focus is on making false or biased conclusions. How to avoid unfair conclusions even if they are true? As an example, in automated matching of candidates with job advertisements, data science algorithms may indirectly infer, propagate, and even exaggerate gender or ethnicity related biases. Data science algorithms are designed to pick up statistical patterns in training data. If the training data reflect existing social biases against a segment of society, the algorithm is likely to incorporate these biases. In this Master project, the goal is to provide novel techniques to ensure fair conformance and performance diagnostics by combining state-of-the-art process mining techniques with ideas from discrimination-aware data mining. Unlike existing optimization techniques for computing optimal alignments we would like to separate (1) likelihood, (2) severity and (3) blame. Process models obtained using process mining can be used for performance analysis by replaying the event log and identifying bottlenecks, delays, etc. Differences between groups of cases and resources become visible, but this may easily lead to misleading conclusions. Discrimination-aware process mining techniques need to be developed that can detect and diagnose unfairness in processes.

Prerequisites:
Good programming skills and knowledge of basic computer science concepts. An interest in process mining and responsible data science.

For more information:
Send an e-mail to prof.dr.ir. Wil van der Aalst wvdaalst@pads.rwth-aachen.de. Make sure to include some information about your background and scores for completed courses.

Chair of Process and Data Science

Ahornstr.55 (Eingang Mies-van-der-Rohe-Str.), Erweiterungsbau E2

52074 Aachen

Phone: +49 241 8021901

www.pads.rwth-aachen.de