Process Mining

Barbara Re – Andrea Polini

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Who am I?

Barbara Re

Education

- Bachelor and Master Degree in Computer Science
- PhD in Information Science and Complex System

Some Experiences

- I was visiting PhD at the Information School of University of Washington working with Dr. Hans J (Jochen) Scholl
- I was visiting Phd at the School of Business of University of Applied Sciences North-western Switzerland FHNW working with Prof. Knut Hinkelmann

Current Position

- Assistant Professor at University of Camerino

Andrea Polini

Education

- Master Degree in Computer Science
- PhD in Computer Engineering

Some Experiences

- I was researcher at CNR – ISTI
- I was visiting PhD at UCL

Current Position

- Associate Professor at University of Camerino

Our Research Interests "random"

- Service Oriented Architecture

- Business Process Management

- Applied Formal Methods

- Software Testing

- ...

PROcesses and Services Lab

http://pros.unicam.it/

What about you?
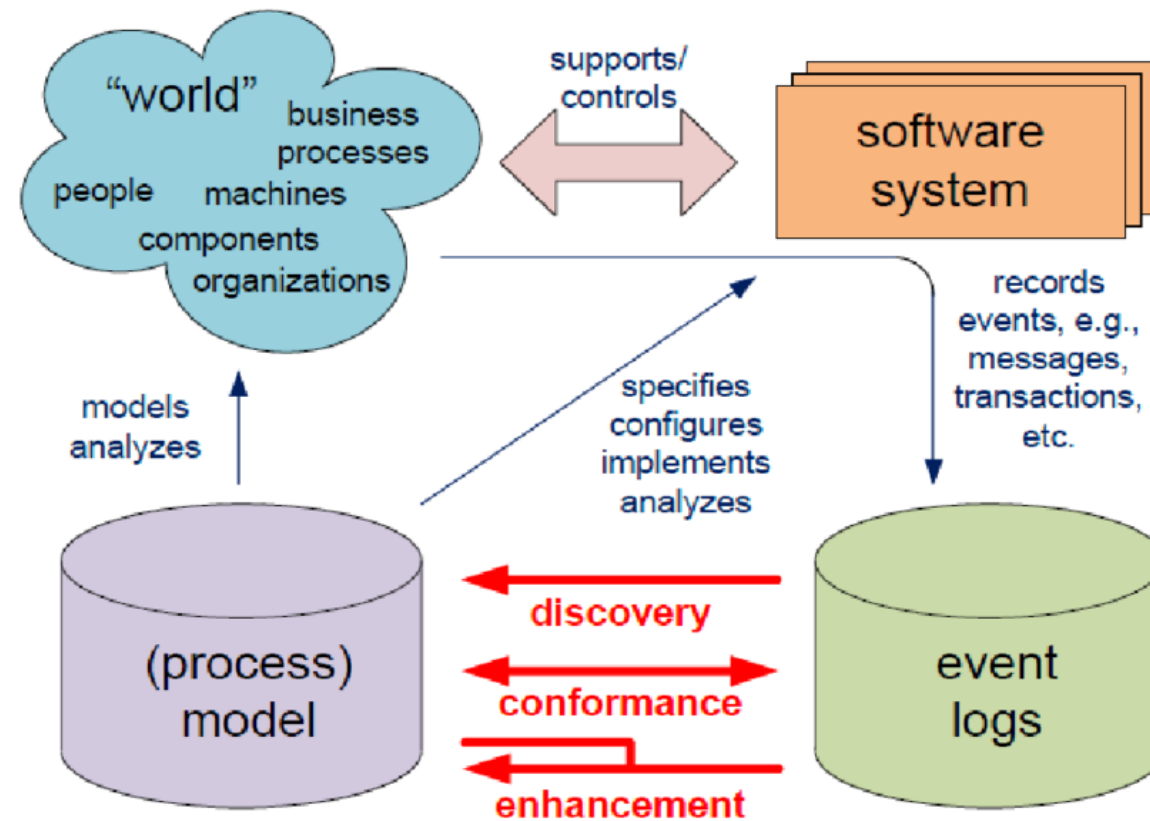
Process Mining

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Course Objectives

- This course focuses on the the **missing link between model-based process analysis and data-oriented analysis techniques**

- The course provides **data science knowledge** that can be applied directly to analyze and improve processes in a variety of domains

- The course explains **various process discovery algorithms**,

- The course introduce **conformance techniques** to compare processes and event data

- The course provides to students the opportunity to **experiment with real tools**

Learning Outcomes

- At the end of the course, the students will gain familiarity with **process mining** terminology, methodology and technologies

- Be able to **apply basic process discovery techniques** to learn a process model from an event log

- Be able to **apply basic conformance checking techniques** to compare event logs and process models

- Have a good understanding of the data needed to **start a process mining project**

- Be able to **conduct process mining pr**ojects in a structured manner

Focus

Syllabus

Introduction to Process Mining and Data Mining
- Data and Logs
- Play-in, Play Out and Reply
- Fundamentals of Process Modelling

From Event Logs to Process Models
- Getting Data
- Process Discovery
- Discovery Techniques an Introduction
- Tools support

Discovery Algorithms
- Alfa
- Inductive Miner
- Heuristic Miner 6.0
- Split Miner
- ILP Miner

Conformance Checking
- Business Alignment and Auditing
- Token Replay
- Process Drift
- Business Process Model and Instances
- Business Process Life-Cycle
- Classification of Business Process

Reference books

Process Mining: Data Science in Action by W.M.P. van der Aalst, Springer Verlag, 2016 (ISBN 978-3-662-49850-7).
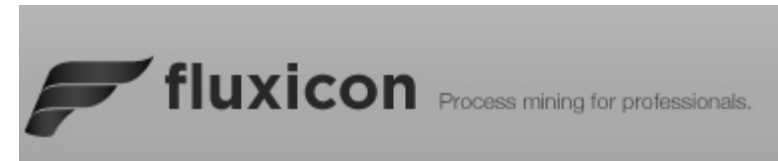
http://www.processmining.org/book/start
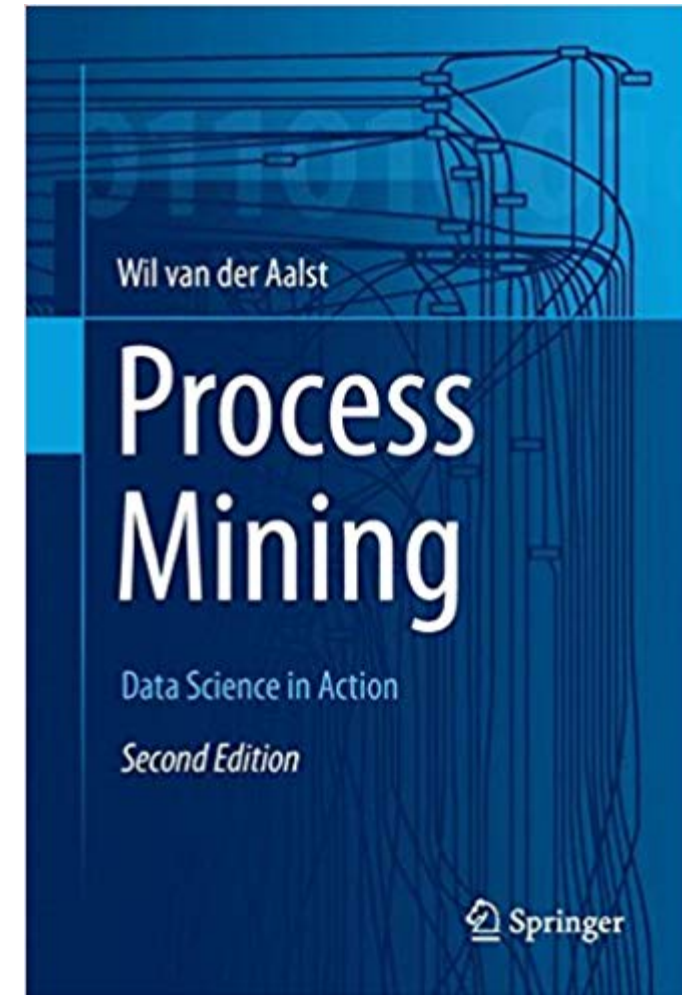
Further materials

- XES standard - http://xes-standard.org/

- Research papers selected during the course (all of them will be available/linked on the wiki)

Tools

- Apromore → http://apromore.unicam.it/

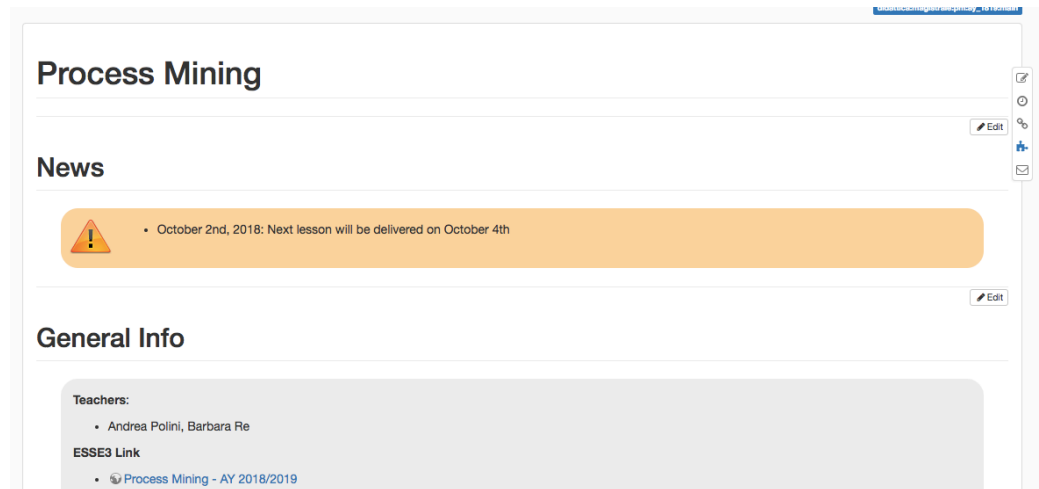- Disco → https://fluxicon.com/disco/

- ProM →

Teaching and Learning Methods

- 42h - Lectures and class exercises

  - Monday: 2:00 pm– 4:00 pm

  - Thursday: 2:00 pm– 4:00 pm

- Private study: reading and exploring

WIKI CS

All Relevant Information Available on the Wiki CS

http://didattica.cs.unicam.it/doku.php?id=didattica:magistrale:pm:ay_1819:main

Exams

- **Project Based Examination** on the topics of the syllabus including project presentation

  - Process Mining Challenge
    - We will provide real data set
    - We will provide questions to be answered

  - We expect that you can focus on a *specific aspect* of interest and analyze this aspect in great detail using any technique, method, algorithm, and tool

  - We will judge based on
    - the originality of the results
    - the validity of the claims
    - the depth of the analysis of specific issues identified

- **Dates** (https://didattica.unicam.it/Home.do)

Students Communications

https://t.me/essunicam

Questions?