Process Mining

Barbara Re

Contacts

- Computer Science Division
- 2 floor (Lodovici Building)

barbara.re@unicam.it

@barbara_re

https://www.linkedin.com/in/barbarare

Who am I?

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

My Research Interests

- Applied Formal Methods
- Business Process Management: from Modelling to Analysis
- Process Aware Information Systems
- Methodologies and Technologies for Smart Government and Ambient Assisted Living development

PROcesses and Services Lab

http://pros.unicam.it/

PROcesses and Services Lab

Research carried out within the PROS Lab deals with:

- The development of **languages** and **techniques** for the **modelling and analysis**
- The development of **process aware information systems** and **services oriented applications**

Our goal is to push the use of **formal methods** as <u>methodological</u> and <u>automatic tools</u> for the development of high-quality software

To make our tools usable by people not acquainted with the underlying mathematical foundations; **we aim at effective but disappearing formal methods**
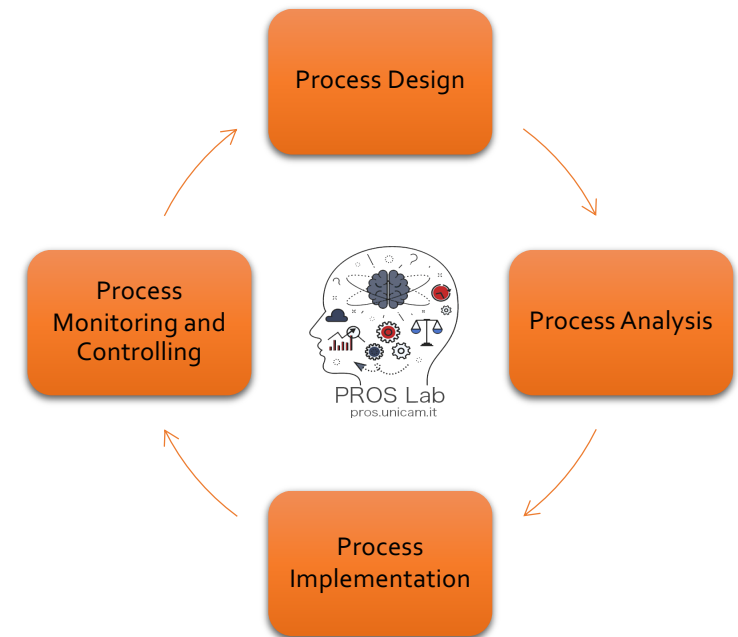
What about you?
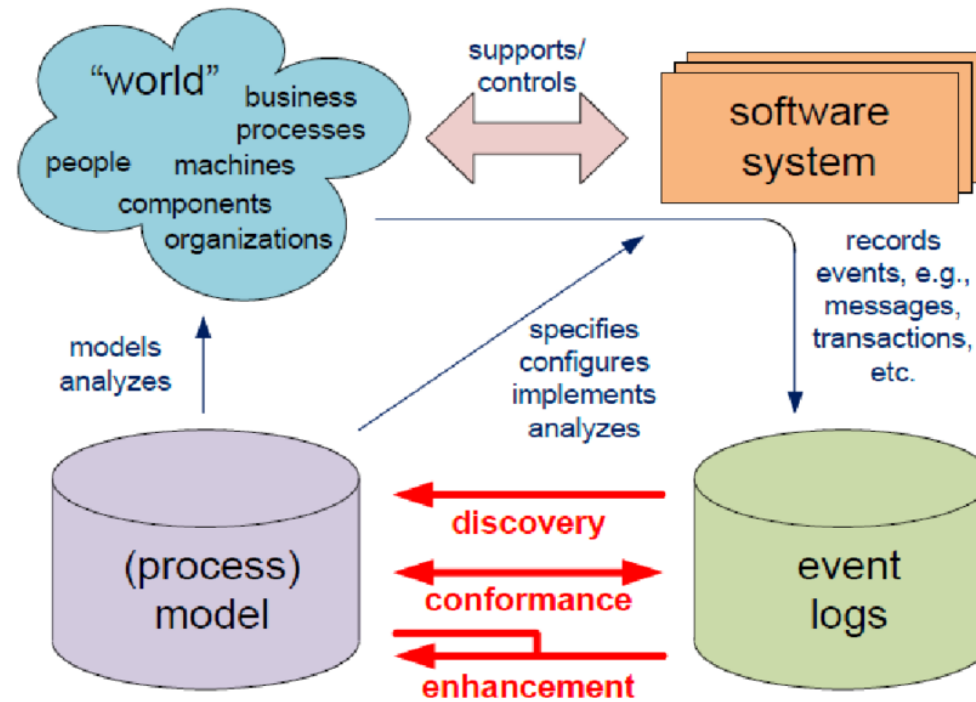
Process Mining

Barbara Re

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 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** projects

Focus

Syllabus

Introduction:
- From Internet of Events to Process Mining
- Logs: Play-in, Play Out and Reply
- Positioning Process Mining

Preliminaries
- Process Modelling and Analysis
- Data Mining

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

Beyond Process Discovery
- Conformance Checking
- Mining Additional Perspective

- **Putting Process Mining to Work**
  - Business Activity Monitoring, KPI and Improvement
  - Blockchain Technologies
  - Sensors, Internet-of-Things (IoT) and wearable devices

Reference books

Process Mining: Data Science in Action by
W.M.P. van der Aalst, Springer Verlag,
2016 (ISBN 978-3-662-49850-7).

Wil van der Aalst

Process Mining

Data Science in Action

Second Edition

Springer

http://www.processmining.org/book/start
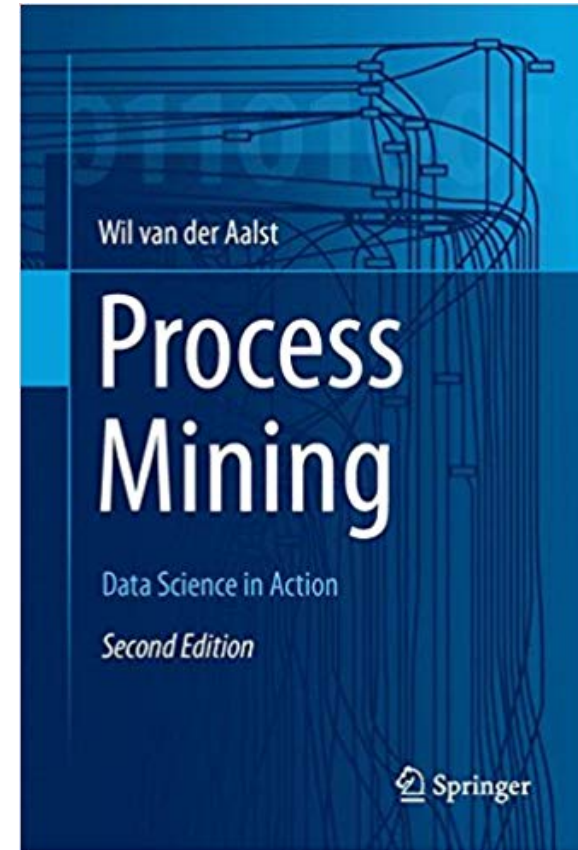
Further materials

- 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 →http://www.promtools.org/
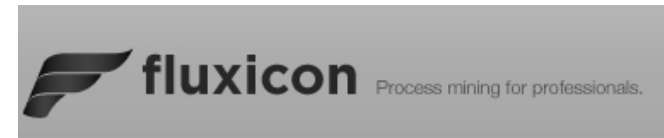
Teaching and Learning Methods

- 42h - Lectures and class exercises

    - Monday: 2:00 pm – 4:00 pm

    - Wednesday: 11:00 am – 13:00 am

- 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_1920:main

Exam

- **Written test**. On the exam date a written test takes place, it has a mixed structure: solution of exercises, and open/close answer questionnaire.

- Realisation of a **project** with a software tool presented during the course, or writing of a report. There is an **oral discussion**.

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

Students Communications

https://t.me/essunicam

Questions?