Summer Term 2019
Seminar / Proseminar
„Recent Research Topics in Workflow Analysis,
Privacy and Machine Learning"

Kick-Off Meeting 30th April 2019

SYSTEME DER INFORMATIONSVEWALTUNG, PROF. DR.-ING. KLEMENS BÖHM
INSTITUT FÜR PROGRAMMSTRUKTUREN UND DATENORGANISATION, FAKULTÄT FÜR INFORMATIK

KIT – Die Forschungsuniversität in der Helmholtz-Gemeinschaft

Organizer

- Institute for Program Structures and Data Organisation (IPD)

- Chair for Systems of InformationManagement Prof. Klemens Böhm

  - ➢ Jutta Mülle, Room 361, muelle@kit.edu

  - ➢ Elaheh Ordoni, Room 362, elaheh.ordoni@kit.edu

  - ➢ Christine Tex, Room 341, christine.tex@kit.edu

  - ➢ Jakob Bach, Room 351, jakob.bach@kit.edu

  - ➢ Ábel Elekes, Room 339, abel.elekes@kit.edu

- Informatics Building Am Fasanengarten 5 (Building 50.34), 3rd floor

- Web-Seite: dbis.ipd.kit.edu

Learning Objectives

Intensive, critical reflection on a current research approach/topic

- Literature search and comparison with related work

- Oral presentation

- Discussion

- Preparing an elaboration / a report

Topics of the Proseminar (Bachelor)

- Business Process Management (BPM) is a mature and often used technique in business and other domains

- Recent challenges come from new formal approaches to handle data in workflows, new application domains and technical innovations,

Supervisor: Elaheh Ordoni

- ## P1: Verification Methods with Probabilistic Logics

Li, H.: Modeling and verification of probabilistic data-aware business processes. 3, (2015). (Chapter 4)

- ## P2: Reduction of Process Models for Enabling Verification of Large Processes

Mrasek, R., Mülle, J., & Böhm, K."A new verification technique for large processes based on identification of relevant tasks." *Information Systems* 47 (2015): 82-97.

Topics of the Proseminar (Bachelor) (2)

Supervisor: Jutta Mülle

- **Topic P3: SMT-based Process Verification**

S. Baarir, R. Bendraou, H. Metin, Y. Laurent: ProVer: An SMT-based Approach for Process Verification. Proc. MODELS-Workshop MoDeVVa, Copenhagen, Oct. 2018, CEUR-WS.org, Vol. 2245, pp. 555-562

- **Topic P4: Process Verification with Data - a Database-Theory Perspective**

R. DeMasellis, C. Di Francescomarino, C. Ghidini, M. Montali, S. Tessaris: Add Data into Business Process Verification: Bridging the Gap between Theory and Practice, Proc. Artificial Intelligence AAAI, 2017

D. Calvanese, M. Montali, G. De Giacomo: Foundations of Data-Aware Process Analysis: A Database Theory Perspective. PODS, June 2013, pp. 22-27

- **Topic P5: Process Management in the Cloud**

P. Waibel, C. Hochreiner, S. Schulte, A. Koschmider, J. Mendling: ViePEP-C: A Container-based Elastic Process Platform. IEEE Transactions on Cloud Computing PP (99), April 2019

Topics of the Seminar – BPM

- Business Process Management (BPM) is a mature and often used technique in business and other domains
- Recent challenges come from new formal approaches to handle data in workflows and technical innovations like Cloud computing

Supervisor: Elaheh Ordoni

- Topic S1: Reduction of State Space in Processes with Underlying Data Layer

Knuplesch, David, et al. On enabling data-aware compliance checking of business process models. Springer, Berlin, Heidelberg, 2010.

Supervisor: Jutta Mülle

- Topic S2: Evaluation Framework for Data-centric Process Management

S. Steinau, A. Marrella, K. Andrews, F. Leotta, M. Mecella, M. Reichert: DALEC: a framework for the systematic evaluation of data-centric approaches to process management software. Software & Systems Modeling, Springer, 2018, pp. 1-38

Topics of the Seminar – Privacy in Querying Databases

- Databases frequently contain private data, e.g., location data

- Challenge: Publish aggregated statistics, e.g., histograms or results of range-count queries about the database, but do not disclose private data

- Solution: Sanitize the statistics, or database itself, according to the differential privacy framework (Aggregation alone is not enough!)

Supervisor: Christine Tex

- Topic S3: Differentially private database indices for answering range queries

Cormode, Graham et. al, „Differentially Private Spatial Decompositions", IEEE ICDE, 2012.

- Topic S4: Differentially privacy statistics on dynamic databases

Li, Haoran et. al, "Differentially Private Histogram Publication For Dynamic Datasets: An Adaptive Sampling Approach", CIKM, 2015.

Topics of the Seminar – Meta-Learning

- Classical supervised machine-learning: make predictions for one dataset, consisting of several data objects

- Meta-learning: make predictions for a meta-dataset, each meta-data-object being a base dataset (described by certain characteristics) → e.g., predict which base classifier is best on which base dataset

Supervisor: Ábel Elekes, Student: Moritz Renftle

- Topic S5: Taxonomy of Use Cases for Word Embedding Models

Supervisor: Jakob Bach

- Topic S6: Meta-Learning Approaches for Clustering

De Souto, Marcilio CP, et al. "Ranking and selecting clustering algorithms using a meta-learning approach." *2008 IEEE International Joint Conference on Neural Networks*. IEEE, 2008.

- Topic S7: Generating Training Examples in Meta-Learning

Sousa, Arthur FM, et al. "Active learning and data manipulation techniques for generating training examples in meta-learning." *Neurocomputing* 194 (2016): 45-55.

Requirements for Passing the Seminar

- Prepare
    - Report structure (with some keywords) and literature list
    - Presentation slides
    - Report
- Oral presentation
- Actively participate at all oral presentation events
- Assessment: Preparation phase and report, oral presentation may change the assessment up to two grades better or worse.

Dates and Deadlines / Presentation Blocks

- Presentation dates each with 3 presentations at SR 348, 13:30 – 15:30 (19.6., 03.07 at 14:00)

3 Alternatives:

- *Wednesday afternoon? (19.06., 26.06., 03.07., 10.07.)*

- *Thursday afternoon? (27.06., 04.07., 11.07., 18.07.)*

- *Mixed? (Wednesday and Thursday afternoon):*
    - *26.06. and 27.06.*
    - *03.07. and 04.07.*

Assignment of the Topics

Topic P1: Verification Methods with Probabilistic Logics *Raoul Schwaguweiss*

Topic P2: Reduction of Process Models for Enabling Verification of Large Processes

Topic S1: Reduction of State Space in Processes with Underlying Data Layer

Topic P3: SMT-based Process Verification *Samrat Bistha*

Topic P4: Process Verification with Data - a Database-Theory Perspective *Fangzy Xu*

Topic S2: Evaluation Framework for Data-centric Process Management

Topic S3: Differentially private database indices for answering range queries *Lugao Zhao*

Topic S4: Differentially privacy statistics on dynamic databases *David Siegel*

Topic P5: Process Management in the Cloud *Rusheel Jyet*

Topic S5: Taxonomy of Use Cases for Word Embedding Models *N. Renftle*

Topic S6: Meta-Learning Approaches for Clustering *Markus Molet*

Topic S7: Generating Training Examples in Meta-Learning *Alexis Berkwod*

Assignment of the Topics (not yet complete!)

- Topic P1: Raoul Schwagmeier
- Topic P2: -
- Topic P3: Samrat Bista
- Topic P4: Fangyi Xu
- Topic P5: Rusheel Iyer
- Topic S1: -
- Topic S2: Luyao Zhao
- Topic S3: David Siegele
- Topic S4: -
- Topic S5: Moritz Renftle
- Topic S6: Markus Mohr
- Topic S7: Alexis Bernhard

Organization

- Initial training: Reading and understanding the article(s) given

- Literature search

- Prepare material for oral presentation / for report
  - Adequate selection and structuring
  - Presentation of the relationships
  - Use own examples
  - Clearly present the facts (e. g., motivate, structure top-down)
  - Explain used terms
  - Critical evaluation
  - Sharply distinguish the approach presented from other literature
  - Provide good readability (e. g., enumerate the figures in your report and reference each figure in the text)

- The seminar report must not be a **1:1-version or translation** of the publication presenting the approach!

Formal Requirements

- Proseminar (Bachelor)
  - Report with 10-12 pages w/o title page and references
  - Minimum 2 new bibliographic references
  - Precise academic style
  - 20-25 minutes oral presentation (ca. 17 slides)

- Seminar (Master):
  - Report with 12-15 pages w/o title page and references
  - Minimum 4 new bibliographic references
  - Precise academic style
  - 20-25 minutes oral presentation (ca. 17 slides)

Technical/ Organisational Instructions

- Report: Use LaTeX or Word / OpenOffice

- Springer LNCS Format (Lecture Notes in Computer Science).

- Downloads + Guidelines see http://www.springer.com/computer/lncs?SGWID=0-164-6-793341-0

- Presentation: Use Powerpoint, OpenOffice or PDF.

Dates and Deadlines

- Final registration until 6th May at the „Studierendenportal":
    - SPO 2015:
        - 7500102 Proseminar
        - 7500040 Seminar
- Tutorial: How to give a presentation?
- Deadline for Report structure and literature list: 21.05.2019
- Individual discussions with the supervisor:

    during the period 28.5.-13.06.2019 (ask for meeting!)

Dances and Deadlines / 2

- Presentation dates each with 3 presentations at SR 348, 13:30 – 15:30
  - 26.06..2019 (Topics P1, P2 and S1)
  - 27.06.2019 (Topics P3, P4 and S2)
  - 03.07..2019 (Topics S3, S4, and P5)
  - 04.07.2019 (Topics S5, S6 and S7)

- Deadline for first version of the complete presentation (slides): **2 weeks before** presentation date, then work on comments of the supervisor

- Deadline for the report: 31.08.2019

Literature Research

A lot of papers are already on your computer?

Official Organisations

Google Scholar

Redo the above query as: Quoted author name ○ Word matching ●

Beliebige Zeit
Seit 2019
Seit 2018
Seit 2015
Zeitraum wählen...

Nach Relevanz
sortieren
Nach Datum
sortieren

Beliebige Sprache
Seiten auf Deutsch

☑ Patente
einschließen
☑ Zitate
einschließen

✉ Alert erstellen

▸
Show the calculator

Process verification
W Cockerille, SG LeMay, R Breckner - US Patent 6,685,567, 2004 - Google Patents
A disclosed gaming machine provides methods and apparatus of verifying the authenticity of
gaming software stored in and executed from RAM on the gaming machine. When
presenting a game on the gaming machine, a master gaming controller may dynamically …
☆ 99 Zitiert von: 466 Ähnliche Artikel Alle 4 Versionen ❯❯

Business **process verification**–finally a reality!
MT Wynn, HMW Verbeek, Business Process - Business Process …, 2009 - emeraldinsight.com
Purpose–The purpose of this paper is to demonstrate that **process verification** has matured
to a level where it can be used in practice. This paper reports on new **verification** techniques
that can be used to assess the correctness of real-life models. Design/methodology …
☆ 99 Zitiert von: 164 Ähnliche Artikel Alle 18 Versionen

Algebraic **process verification**
JF Groote, MA Reniers, Handbook of process, algebra - Handbook of process algebra, 2001 - Elsevier
This chapter addresses the question how to verify distributed and communicating systems in
an effective way from an explicit **process** algebraic standpoint. This means that all
calculations are based on the axioms and principles of the **process** algebras. The first step …
☆ 99 Zitiert von: 153 Ähnliche Artikel Alle 10 Versionen ❯❯

Confluence for **process verification**
JF Groote, MPA Sellink - Theoretical computer science, 1996 - Elsevier
We provide several notions for confluence in processes and we show how these relate to τ-
inertness, ie if then s and s' are equivalent. Using clustered linear processes we show how
these notions can conveniently be used to reduce the size of state spaces and simplify the …
☆ 99 Zitiert von: 97 Ähnliche Artikel Alle 11 Versionen Web of Science: 27

Verwandte Suchanfragen

continuous process verification   **fda** process verification

business process verification   process verification **protocol**

validation process verification   **pharmaceutical** process verification

Archives / Digital Libraries

- dl.acm.org

- ieeexplore.ieee.org

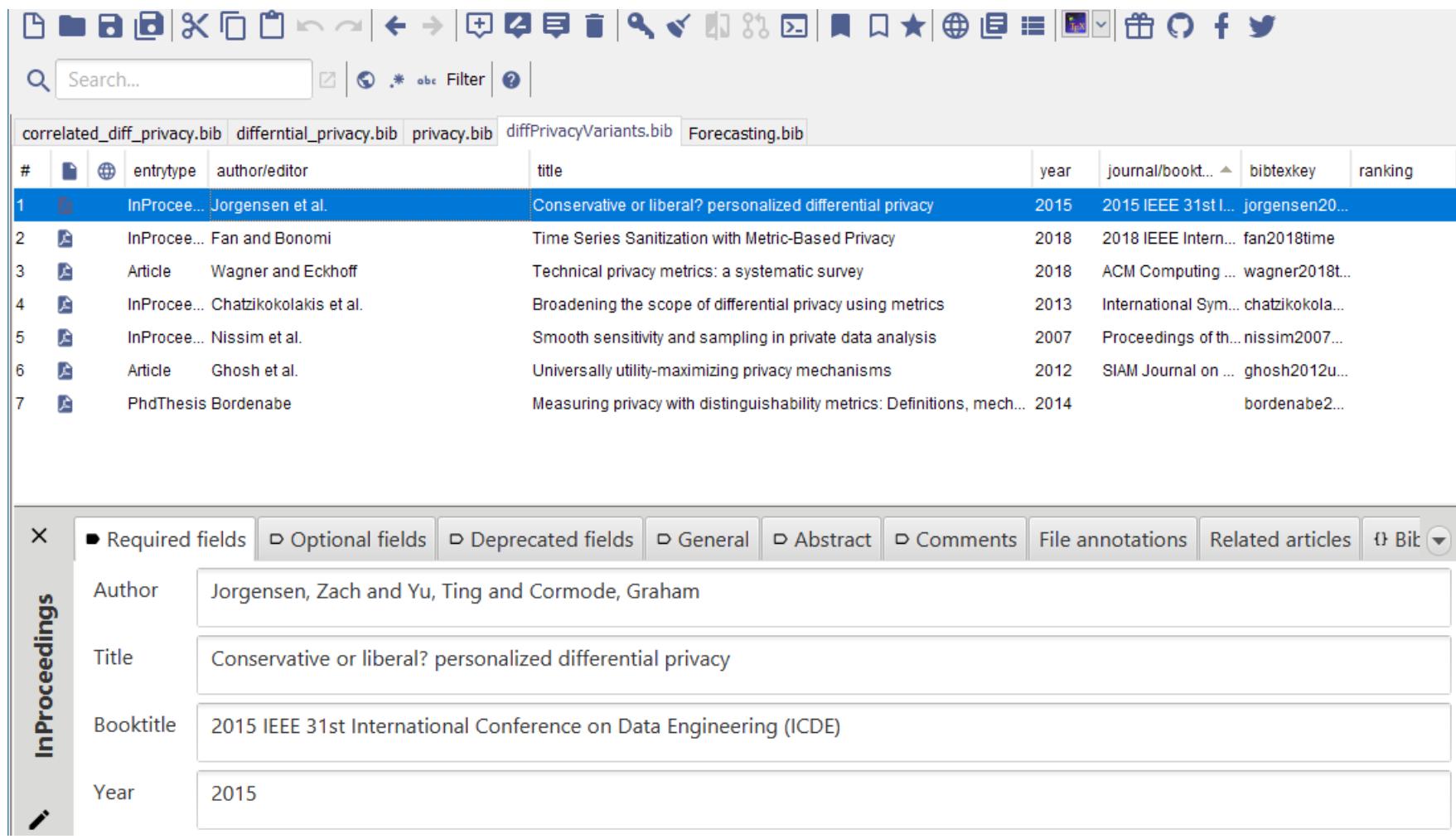- link.springer.com

- citeseer.ist.psu.edu

- dblp.uni-trier.de/db

Latex (BibTex)

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@INPROCEEDINGS{1143123,
 author = {Carolyn A. Brodie and Clare-Marie Karat and John Karat},
 title = {An empirical study of natural language parsing of privacy policy
    rules using the SPARCLE policy workbench},
 booktitle = {SOUPS '06: Proceedings of the second symposium on Usable
    privacy
    and security},
 year = {2006},
 pages = {8--19},
 address = {New York, NY, USA},
 publisher = {ACM Press},
 doi = {http://doi.acm.org/10.1145/1143120.1143123},
 isbn = {1-59593-448-0},
 location = {Pittsburgh, Pennsylvania}
}
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Literature Research (JabRef)