Meeting of the IEEE Task Force on Process Mining

Monday August 26th, 2013, 15.30-17.00
Room 5, Building 1, Xijiao Hotel,
No.18 Wangzhuang Road, Haidian District, Beijing, China

http://www.win.tue.nl/ieeeetfpm/
Agenda

• 15.30 Introduction of participants and IEEE Task Force on Process Mining
• 15.45 Overview of activities 2012-2013 (movies, LinkedIn, workshops, journals, presentations, etc.)
• 16.00 Restructuring the Task Force's Website
• 16.05 Standardization process of XES
• 16.15 Sharing event logs
• 16.30 Process Mining in China
• 16.45 Development of new activities for 2013-2014
• 17.00 Closing
Organizations Supporting The Task Force (1/3)
Organizations Supporting The Task Force (3/3)
<table>
<thead>
<tr>
<th>Aalst, Wil van der</th>
<th>Accorsi, Rafael</th>
<th>Baier, Thomas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blickle, Tobias</td>
<td>Brand, Peter van den</td>
<td>Brandtjen, Ronald</td>
</tr>
<tr>
<td>Burattin, Andrea</td>
<td>Carmona, Josep</td>
<td>Castellanos, Malu</td>
</tr>
<tr>
<td>Chesani, Federico</td>
<td>Claes, Jan</td>
<td>Cook, Jonathan</td>
</tr>
<tr>
<td>Costantini, Nicola</td>
<td>Cunningham, Mitchell</td>
<td>Curbera, Francisco</td>
</tr>
<tr>
<td>Depaire, Benoît</td>
<td>De Weerdt, Jochen</td>
<td>Dongen, Boudewijn van</td>
</tr>
<tr>
<td>Duftler, Matthew</td>
<td>Dumas, Marlon</td>
<td>Ferreira, Diogo</td>
</tr>
<tr>
<td>Geffen, Frank van</td>
<td>Goel, Sukriti</td>
<td>Günther, Christian</td>
</tr>
<tr>
<td>Guzzo, Antonella</td>
<td>Harmon, Paul</td>
<td>Hofstede, Arthur ter</td>
</tr>
<tr>
<td>Hoogland, John</td>
<td>Ingvadsen, Jon Espen</td>
<td>Jans, Mieke</td>
</tr>
<tr>
<td>Jung, Jae-Yoon</td>
<td>Kalenkova, Anna</td>
<td>Kato, Koki</td>
</tr>
<tr>
<td>Khalaf, Rania</td>
<td>Kuhn, Rudolf</td>
<td>Kumar, Akhil</td>
</tr>
<tr>
<td>Lakshmanan, Geetika</td>
<td>La Rosa, Marcello</td>
<td>Lehto, Teemu</td>
</tr>
<tr>
<td>Liu, Yingbo</td>
<td>Malerba, Donato</td>
<td>Mans, Ronny</td>
</tr>
<tr>
<td>Manuel, Alberto</td>
<td>McCreesh, Martin</td>
<td>Mello, Paola</td>
</tr>
<tr>
<td>Mendling, Jan</td>
<td>Mitsyuk, Alexey</td>
<td>Morozova, Natalia</td>
</tr>
<tr>
<td>Motahari Nezhad, Hamid Reza</td>
<td>Muehlen, Michael zur</td>
<td>Mukhi, Nirmal</td>
</tr>
<tr>
<td>Munoz-Gama, Jorge</td>
<td>Muthusamy, Vinod</td>
<td>Omokpo, Amos</td>
</tr>
<tr>
<td>Passova, Sofia</td>
<td>Reason, Johnathan</td>
<td>Rembert, Aubrey J</td>
</tr>
<tr>
<td>Roermund, Mark van</td>
<td>Rozinat, Anne</td>
<td>Rozsnyai, Szabolcs</td>
</tr>
<tr>
<td>Schut, Martijn</td>
<td>Sequel Pérez, Hugo</td>
<td>Seguel Pérez, Ricardo</td>
</tr>
<tr>
<td>Sepúlveda, Marcos</td>
<td>Sinur, Jim</td>
<td>Slominski, Aleksander</td>
</tr>
<tr>
<td>Soffer, Pnina</td>
<td>Song, Minseok</td>
<td>Sperduti, Alessandro</td>
</tr>
<tr>
<td>Stoel, Casper</td>
<td>Swenson, Keith</td>
<td>Talamo, Maurizio</td>
</tr>
<tr>
<td>Turner, Chris</td>
<td>Vanderhaeghen, Dominik</td>
<td>Vanherle, Walter</td>
</tr>
<tr>
<td>Vanschoenwinkel, Bram</td>
<td>Vanthienen, Jan</td>
<td>Varvaressos, George</td>
</tr>
<tr>
<td>Verbeek, Eric</td>
<td>Verdonk, Marc</td>
<td>Vigo, Roberto</td>
</tr>
<tr>
<td>Wang, Jianmin</td>
<td>Weber, Barbara</td>
<td>Webster, Charles</td>
</tr>
<tr>
<td>Wefters, Harold</td>
<td>Weijters, Ton</td>
<td>Wen, Lijie</td>
</tr>
<tr>
<td>Westergaard, Michael</td>
<td>Wynn, Moe</td>
<td></td>
</tr>
</tbody>
</table>
Goals

• The goal of this Task Force is to promote the research, development, education and understanding of process mining.

• More concretely, the goal is to:
  – make end-users, developers, consultants, and researchers aware of the state-of-the-art in process mining,
  – promote the use of process mining techniques and tools and stimulating new applications,
  – play a role in standardization efforts for logging event data,
  – the organization of tutorials, special sessions, workshops, panels,
  – the organization of Conferences/Workshop with IEEE CIS Technical Co-Sponsorship, and
  – publications in the form of special issues in journals, books, articles (e.g., in the IEEE Computational Intelligence Magazine).

• Note that process mining includes (automated) process discovery (extracting process models from an event log), conformance checking (monitoring deviations by comparing model and log), social network/organizational mining, automated construction of simulation models, case prediction, and history-based recommendations.
WHO ARE YOU?

HELLO!
My name is
Overview of activities 2012-2013
Further Distribution of the Manifesto

Process Mining

Recent breakthroughs in process mining research make it possible to discover, analyze, and improve business processes based on event data. Activities executed by people, machines, and software leave trails in so-called event logs. What events (such as entering a customer order into SAP, a passenger checking in for a flight, a doctor changing a patient’s dosage, or a planning agency rejecting a building permit) have in common is that all are recorded by information systems. Data volume and storage capacity have grown spectacularly over the past decade, while the digital universe and the physical universe are increasingly aligned. Business processes thus ought to be managed, supported, and improved based on event data rather than on subjective opinions or obsolete experience.

Application of process mining in hundreds of organizations worldwide shows that managers and users alike have overestimated their knowledge of their own processes. Process mining results can thus be viewed as X-rays revealing what really goes on inside processes and can be used to diagnose problems and support proper treatment. The practical relevance of process mining and related interesting scientific challenges makes process mining a hot topic in business process management (BPM). This article offers an introduction to process mining by discussing the core concepts and applications of the emerging technology.

Process mining aims to discover, monitor, and improve real processes by extracting knowledge from event logs readily available in today’s information systems. Although event data is everywhere, management decisions tend to be based on PowerPoint charts, local politics, or management dashboards rather than on careful analysis of event data. The knowledge hidden in event logs cannot be turned into actionable information. Advances in data mining made it possible to find valuable patterns in large datasets and support complex decisions based on the data. However, classical data mining problems (such as classification, clustering, regression, association rule mining, and sequence mining) are process-centric. Therefore, BPM approaches tend to resort to handcrafted models, and process mining research aims to bridge the gap between data mining and BPM. Metaphorically, process mining is to BPM as data mining is to data analysis.

Key insights
- Although large organizations appreciate the value of data, many rely on event data in process mining.
- Building effective process mining is based on the analysis of log data and the extraction of patterns from event data.
- Event data and process models are essential for performance analysis.
- Compliance of event data and process models is vital for performance analysis.
- The pattern growth of event data and process models is measurable.

Keywords: Business Process Management, Process Mining, Discovery, Process Improvement, Total Quality Management

1. Introduzione
Il processo di process mining costituisce un’area di ricerca relativamente giovane, che si posiziona da un lato tra la process management ed il data mining e dall’altro tra la modellazione e l’analisi dei processi di business (per una breve introduzione al concetto di processo e termini correlati, si vedano il Riquadro 1). L’idea di base del process mining è quella di modellare, monitorare e migliorare i processi esistente conoscendo i dati, oggi omnipresenti nel sistemi informatici (Figura 1). I log contengono infatti informazioni legate all’esecuzione dei processi nel mondo reale che
Examples of personal websites promoting the topic/manifesto

Follow such examples
Process Mining Movie

http://www.youtube.com/watch?feature=player_detailpage&v=7oat7MatU_U

Help to promote it: put it on your website!

2.772 views in period 18 jun. 2013 – 18 aug. 2013
Process Mining Movie

Introduction to Process Mining: Turning (Big) Data ...
2.772 weergaven
2 maanden geleden
Movies

• Introduction to Process Mining: Turning (Big) Data into Real Value
  http://www.youtube.com/watch?feature=player_detailpage&v=7oat7MatU_U

• Process Mining In A Nutshell (fluxicon)
  http://fluxicon.com/s/video

• Perceptive Process Mining
  http://www.youtube.com/watch?v=nKy2Sx2WYRE

• Automated Business Process Discovery - QPR ProcessAnalyzer
  http://www.youtube.com/watch?v=HiHkEZwdxW8
Movies (cont'd)

• Fuzzy model animation
  http://www.youtube.com/watch?v=b875FdB4vuo
• Process Mining animations using BPM|one
  http://www.youtube.com/watch?v=BMoEuzqF0P0
• Interstage Automated Process Discovery demo
  http://www.youtube.com/watch?v=XAj2mUlJF-Q
• Nomination of Process Mining Research at TU/e for ICT Regie Award
  http://www.youtube.com/watch?v=Kxpcw-mwzcg
• Presentations on http://fluxicon.com/camp/2012/
Movies (cont'd)

- Prototyping Process Mining for SAP Order-To-Cash
  http://www.youtube.com/watch?v=FIlkmNa5HZhI
- Process mining 20sec
  http://www.youtube.com/watch?v=zT5Jb6J40yc
- Process mining
  http://www.youtube.com/watch?v=o3XeEjLAgN8
- Introduction to Process Mining
  http://www.youtube.com/watch?v=OqLksYkU_JA
- ProcessMining - Improve Revenue, Reduce Cost, Mitigate Risk
  http://www.youtube.com/watch?v=b-NsvQIdOyU
Movies (cont'd)

- Process Variants - Process Mining TV
  http://www.youtube.com/watch?v=WrLK7KTHgIo
- Process Mining animations using BPM|one
  http://www.youtube.com/watch?v=BMoEuzqFOPo
- Process mining (ned)
  http://www.youtube.com/watch?v=oGM4FeCxTVc
- Perceptive Software & Alliander: Process Mining
  http://www.youtube.com/watch?v=DaK_o8e1WKw
- 15-min Video recording bpmNEXT presentation
LinkedIn Group (870 members)

http://www.linkedin.com/groups/Process-Mining-1915049
Activities 2012

- Lots of process mining contributions at last year's BPM (see http://fluxicon.com/blog/2012/10/recap-process-mining-at-bpm-2012/), this year even more!
- Special Session on Process Mining at 2012 IEEE World Congress On Computational Intelligence (June 10-15, Brisbane, Australia), Moe Wynn, Jan Vanthienen, Zbigniew Michalewicz, Adam Ghandar.
- 8th International Workshop on Business Process Intelligence 2012 (Boudewijn van Dongen, Diogo R. Ferreira, Barbara Weber).
- Process Mining Programming Workshop, September 28, 2012 Hasselt University, Belgium (Benoît Depaire), see http://www.processmining.org/workshop/start for slides, etc.
Activities 2012 (cont'd)

- October 2012: 1st BPM Roundtable in Haifa, Israel, Topic: Process Mining
- November 2012: Fluxicon Process Mining talk at the BBC conference in Florida, US
- November 2012: The BPM Roundtable in Eindhoven, the Netherlands, has a couple of process mining-related talks
- November 2012: Alberto Manuel and Antonio Valle talk about process mining at the IT Service Management conference VISION12 in Madrid, Spain
- November 2012: Fluxicon process mining BPMB Workshop in Berlin, Germany
- December 2012: The BPM Roundtable in Eindhoven, the Netherlands, includes a presentation by Tijn van der Heijden about his process mining project at the Rabobank.
Activities 2012 (cont'd)


Activities 2013


Activities 2013 (cont'd)

- Process Mining News by Fluxicon (see [http://fluxicon.com/s/pmnews](http://fluxicon.com/s/pmnews))
- February 2013: Webinars Fluxicon and ProcessGold
- March 2013: G2 is organizing process mining breakfast in Barcelona, Spain (in Spanish)
- March 2013: Fluxicon presents process mining at the bpmNEXT conference
- May: Young Sik Kang presents his work about 'Improving the Performance of Customer Channel Process based on Process Analytics' at the Contact & Communication Management Conference, Korea
- May - June: Mieke Jans teaches a process mining course for auditors at Tilburg University, the Netherlands
- May 2013: Bram Vanschoenwinkel is invited to talk about process mining at a workshop about 'Practical Experiences with Business Analytics', Belgium
- May 2013: Process Mining Masterclass, Eindhoven, the Netherlands
- July 2013: BPMRR Workshop on process mining, Dortmund, Germany
Activities 2013 (cont'd)

• Process mining camp interviews:

• Interview Christian: http://fluxicon.com/blog/2013/02/interview-with-fluxicons-co-founder-christian-w-gunther/

• Interview Steve Kilner: http://fluxicon.com/blog/2013/03/new-article-on-process-mining-for-legacy-systems-in-ibm-systems-magazine/

• Interview with Lalit after winning BPI Challenge last year: http://fluxicon.com/blog/2012/10/a-conversation-with-lalit-wangikar/


• Case studies
Articles promoting the topic

- Maps to tell a story: [http://fluxicon.com/blog/2013/01/maps-to-tell-a-story/](http://fluxicon.com/blog/2013/01/maps-to-tell-a-story/)
- Lots of additional pointers to process mining articles from external parties in 'Process Mining on the Web' section of Process Mining News:
  - * October 2012: [http://goo.gl/A0Qrbu](http://goo.gl/A0Qrbu)
  - * November 2012: [http://goo.gl/DxXfJe](http://goo.gl/DxXfJe)
  - * December 2012: [http://goo.gl/byjS2b](http://goo.gl/byjS2b)
  - * February 2013: [http://goo.gl/imKFfz](http://goo.gl/imKFfz)
  - * March / April 2013: [http://goo.gl/vB5Nqx](http://goo.gl/vB5Nqx)
  - * July 2013: [http://goo.gl/29RI84](http://goo.gl/29RI84)
Special Mentioning: fluxicon

116 academic partners in Fluxicon academic partner program (see Google map: http://goo.gl/maps/vbpPr)
Restructuring the Website
New structure (as agreed last year)
Questions

• Are we missing important people that also want to be active in promoting the topic for a broader audience? (Please provide suggestions, preferably more people from industry, academics should be interested to promote the topic also outside academic world).

• Very uneven distribution of activities. How to activate members more?
Standardization process of XES: Becoming an "official" IEEE Standard

Working Group:
Eric Verbeek, Christian Günther, Wil van der Aalst, Keith Swenson, Moe Wynn, Lijie Wenn, Michael zur Muehlen.
What has been achieved?

- Jun 2013 AdCom meeting
- Motion to start XES standardization process
- It has been decided to postpone the decision
- Proposal on open issues in XES (following discussion in working group)
What went wrong?

• Missed the Dec 2012 AdCom meeting
• Many members unfamiliar with Process Mining
• Not clear why a standard like XES would be needed
• Comments on formulation of motion
• Some members are not so cooperative
What next?

• No Dec 2013 AdCom meeting
• Jun 2014 AdCom meeting
  – Reformulated motion
• New CIS president and vice-president
  – Xin Yao and Yaochu Jin
• 5 new AdCom members
  – Hard to say whether more or less cooperative
• New chair of Standards Committee
  – To be appointed by Xin and Yaochu
Proposal on open issues

**Issue**
- XML
- Sublogs
- No whitespaces
- No compound types
- No empty traces

**Proposal**
- As is
- Extension
- Single quotes and global attributes
- Lists and containers
- Remove restriction

Working Group that guides the IEEE standardization of XES: Proposal working group: Eric Verbeek, Christian Günther, Wil van der Aalst, Keith Swenson, Moe Wynn, Lijie Wenn, Michael zur Muehlen.
Sharing Data Sets
Sharing datasets

• What data sets are available?
  • BPIC datasets
  • http://data.3tu.nl/repository/collection:event_logs
  • http://www.processmining.org/
  • <<provide pointers>>

• Simulated versus real-life data.
• With or without process models.
• Not just BPM tools but also dataset on http://bpm-conference.org/bpt-resource-management/?

• Add pointers to Task Force's website?
• Even better: Add data to 3TU.Datacenter (Boudewijn van Dongen)
### 3TU.Datacenter

### Real life Event Logs

<table>
<thead>
<tr>
<th>Collection</th>
<th>Real life Event Logs</th>
</tr>
</thead>
<tbody>
<tr>
<td>title</td>
<td>Real life Event Logs</td>
</tr>
<tr>
<td>member of</td>
<td>IEEE Task Force on Process Mining - Event Logs</td>
</tr>
<tr>
<td>has member</td>
<td>BPI Challenge 2012</td>
</tr>
<tr>
<td>has member</td>
<td>BPI Challenge 2013_closed problems</td>
</tr>
<tr>
<td>has member</td>
<td>BPI Challenge 2013_incidents</td>
</tr>
<tr>
<td>has member</td>
<td>BPI Challenge 2013_open problems</td>
</tr>
<tr>
<td>has member</td>
<td>Real-life event logs - Hospital log</td>
</tr>
</tbody>
</table>

### How to cite this item

**Citation style Datacite**

Ward Steeman (2013) BPI Challenge 2013, open problems, Ghent University. Dataset: http://doi.org/10.4121/00.1211.3537c36d-6c96-4d16-8125-915eb0a6e479da

**Short link**

http://doi.org/10.4121/00.1211.3537c36d-6c96-4d16-8125-915eb0a6e479da

**More...**

Provided by Datacite & BibTeX & BIB (Reference Manager, EndNote) & more

**Metadata formats**

Dublin Core (v.1.1) | A digital object identifier (DOI) | Datacite

**How to expand all, collapse all**

XML event log (application/x-gzip)

**Metadata for event log (text/xml)**

<table>
<thead>
<tr>
<th>metadata</th>
<th>doi</th>
<th>name</th>
<th>description</th>
<th>language</th>
<th>log_type</th>
<th>process_type</th>
<th>creation</th>
<th>person</th>
<th>place</th>
<th>time</th>
<th>description_caption</th>
<th>sources</th>
<th>source</th>
<th>source_type</th>
<th>creator</th>
<th>creator_type</th>
<th>model</th>
<th>program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Log of Volvo IT problem management (open problems)</td>
<td>English</td>
<td>Real-life</td>
<td>Ad-Hoc structured</td>
<td>BPI Challenge 2013</td>
<td>Ward Steeman</td>
<td>Eindhoven</td>
<td>Fri Apr 12 08:00:00 CEST 2013</td>
<td></td>
<td>Ghent University</td>
<td>Volvo IT</td>
<td>Private company</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rights**

Type: Public

**Number of traces**

819

**Number of events**

2031

**Events per trace**

2.871

**Max events per trace**

1

**Max events per trace**

22

**Global attributes**

<table>
<thead>
<tr>
<th>trace_level</th>
<th>event_level</th>
<th>meta_extensions</th>
<th>extensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Metadata Concept</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metadata General</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metadata Lifecycle</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metadata Organization</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metadata Time</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Completeness Metrics</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concept</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lifecycle</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Organizational</td>
<td></td>
</tr>
</tbody>
</table>
Annual Meeting IEEE Task Force on Process Mining at BPM 2013

Process Mining in China

Lijie Wen
School of Software, Tsinghua University
2013-08-26
Outline

- Panguso
- China Mobile Communication Corporation
- SANY
Development of new activities for 2013-2014
Planned activities 2013-2014

- IEEE Standardization of XES

- Dagstuhl Seminar "Unleashing Operational Process Mining" in 2013
  (Rafael Accorsi, Malu Castellanos, Ernesto Damiani, Wil van der Aalst)
  http://www.dagstuhl.de/en/program/calendar/semhp/?semmnr=13481
Upcoming events

- 18-23 August 2013: Fluxicon has been invited as a keynote speaker at the 'Verifiably Secure Process-Aware Information Systems' Dagstuhl seminar (invitation only - contact Rafael Accorsi to attend), Germany
- 30 August 2013: One-day process mining seminar with seven presentations and case studies in Korea
- 20 September 2013: Anne Rozinat speaks at BPMCon
- 14 October 2013: Fluxicon invited talk at the BPM Practice conference in Vilnius, Lithuania
- 18 October 2013: Fluxicon invited talk at the BPM Practice conference in Hamburg, Germany
- 9-10 December 2013: Fluxicon was accepted for speaking slot at itSMF in Kassel, Germany
Upcoming events


Planned activities 2013-2014

- BPI 2014 at BPM 2014 in Haifa?
- Business Process Intelligence Challenge 2014?
- Special session on process mining @ WCCI'2014 (next page)
- Process Mining Camp 2014?
- Best PhD thesis on BPI topics (suggestion Antonella Guzzo)?
- Summer school on process mining?
- BPTrends articles on BPIC 2013 and the process mining camp (www.bptrends.com)
- Two new process mining courses at TU/e in 2014
- New special issues of journals?
- New workshops?
- New industry events?
IEEE World Congress on Computational Intelligence (IEEE WCCI)

• We need to submit a proposal for a special session on process mining to WCCI'2014 [http://www.ieee-wcci2014.org/].

• Deadline special session proposals: November 15th 2013.

IEEE World Congress on Computational Intelligence (WCCI 2014) will be held in Beijing, China on July 6-11, 2014.
BRIGHT FUTURE AHEAD
More from Moore

Turning event data into value
Closing