Significant Stochastic Dependencies in Process Models

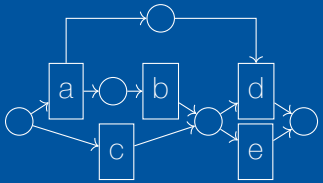
Information Systems

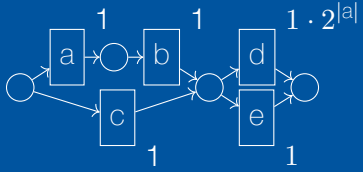
Sander Leemans, Lisa Mannel, Natalia Sidorova

Teaching and Research Area of Business Process Management Foundations and Engineering

RWTH AACHEN UNIVERSITY

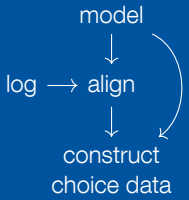
Modelling dependencies





Make it more likely that d executes, after a has been executed.

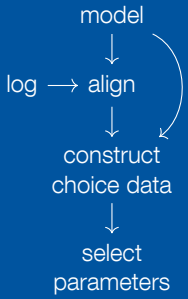
Discovery

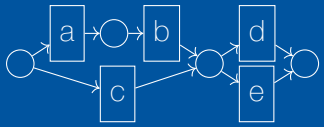


$\langle a, b, d \rangle \rightarrow$

fired	enabled	prefix
a	$\{a, c\}$	$[]$
b	$\{b\} $	$[a^1]$
d	$\{d, e\}$	$[a^1, b^1]$

Discovery



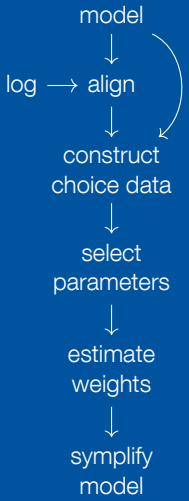


	base weight	adjustment weight a	b	c	d	e
a	+	+	+	+	+	+
b	+	+	+	+	+	+
c	+	+	+	+	+	+
d	+	+	+	+	+	+
e	+	+	+	+	+	+

Reductions:

- Only observed together
- χ^2 test of independence
- …

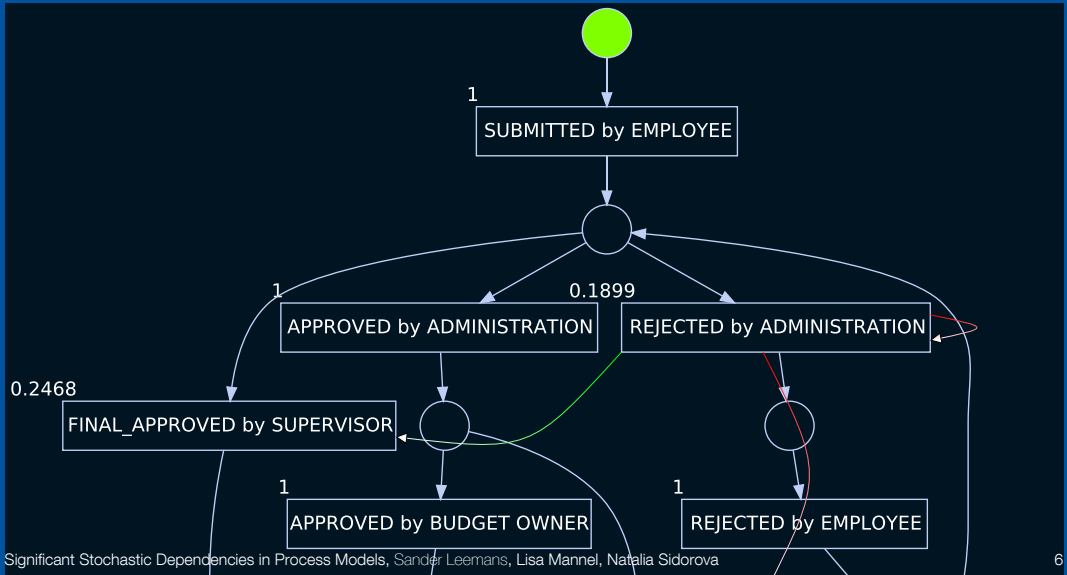
Discovery



Optimise a non-convex problem to find the remaining weight parameters

Post-process the results with more reductions

The result


1
SUBMITTED by EMPLOYEE
1
0.1899
APPROVED by ADMINISTRATION
REJECTED by ADMINISTRATION
0.2468
FINAL_APPROVED by SUPERVISOR
1
APPROVED by BUDGET OWNER
1
REJECTED by EMPLOYEE

You have been watching…

- Stochastic dependencies & how to model them
- Discovering stochastic dependencies
- A visualisation

Future work

- Use better optimisers
- Reductions on arbitrary Petri nets (without using the log)

Sander Leemans
s.leemans@bpm.rwth-aachen.de
http://leemans.ch

Teaching and Research Area of Business Process Management Foundations and Engineering

RWTH AACHEN UNIVERSITY