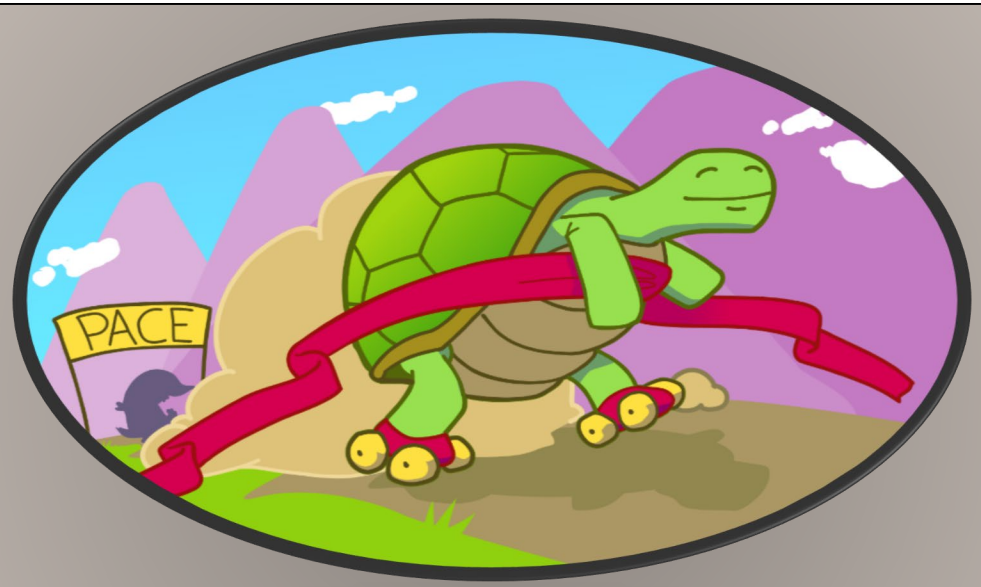
Parameterized Algorithms & Computational Experiments Challenge

www.pacechallenge.org



OPTIL.io

NET WORKS

December 16th, IPEC 2020, Hong Kong

Goals

Investigate the applicability of algorithmic ideas from parameterized algorithmics

1. provide bridge between algorithm theory and algorithm engineering practice
2. inspire new theoretical developments
3. investigate the competitiveness of analytical and design frameworks
4. produce universally accessible libraries of implementations & benchmark inputs
5. encourage dissemination of the findings in scientific papers

Impact of PACE

Story behind PACE 2016

Developed a new algorithm to solve the LP!

⇒ Practical and theoretical improvements

- ➢ 1st place in the competition
- ➢ Linear-time kernelization of FVS (ICALP 2017)
- ➢ Linear-time FPT for various problems (FOCS 2018)

➢ Steiner Tree algorithm developed in PACE 2018 (AAAI 2019).

PACE is a great competition ☺

Motivation: Explaining succe

- PACE 2017: Top 4 solvers on mi
  solver on treewidth track based c
- Implementations based on PMCs:
  - Treewidth [Tamaki, 2019]
  - Fractional hypertreewidth [Korhonen, Berg, and Järvisalo, 2019]
  - Phylogenetics [Korhonen and Järvisalo, 2020]
  - Enumeration of minimal triangulations [Ravid, Medini, and Kimelfeld, 2019]

0 100 200 300 400 500

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Tuukka Korhonen (U. Helsinki) Opt. Triangulations Parameterized by ECC Dec 15. 8 / 19

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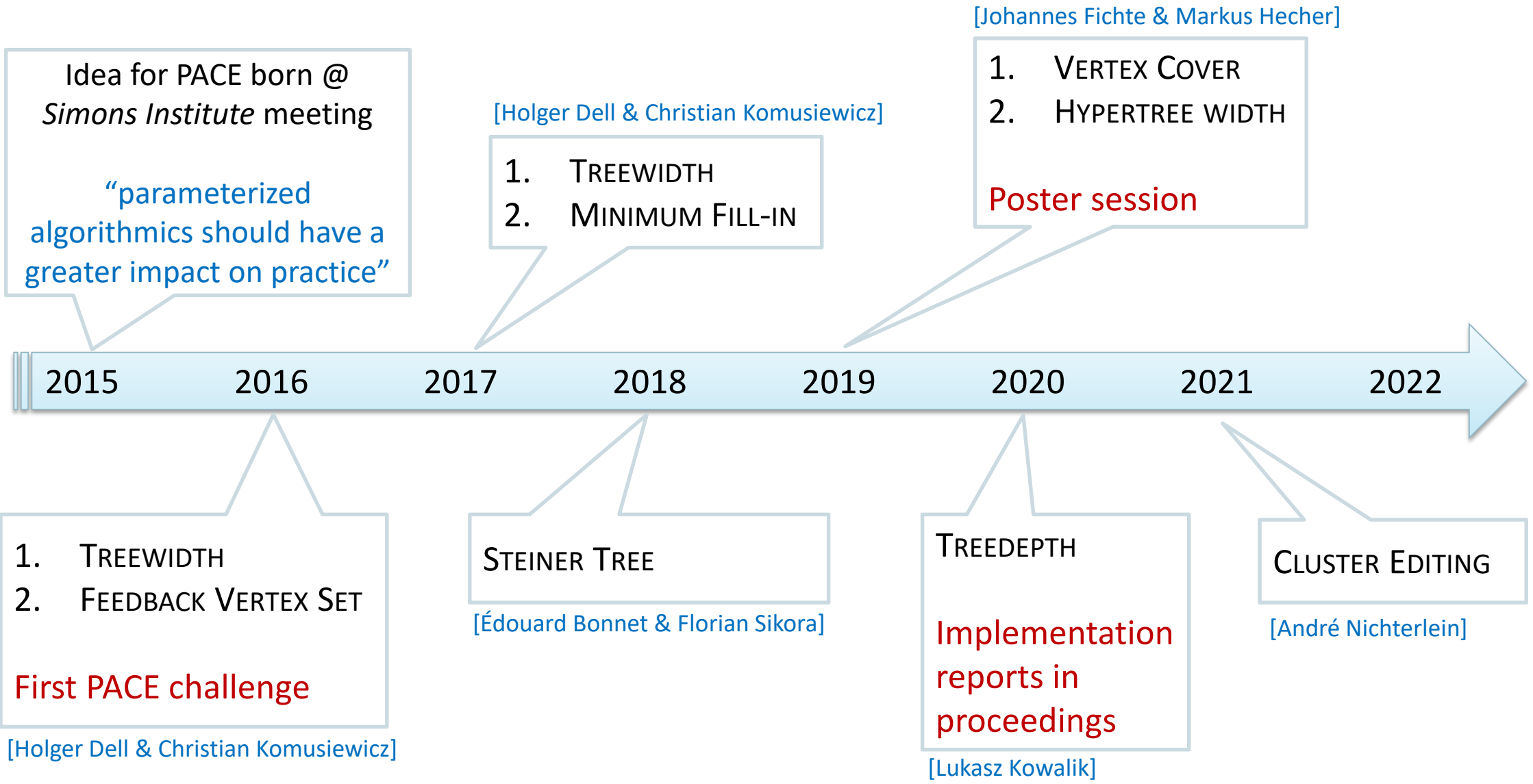
The history of PACE

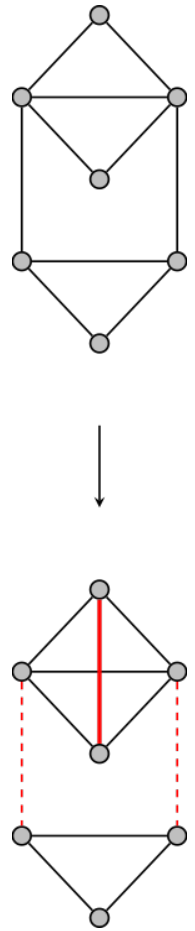


PACE 2021: Cluster Editing

Challenge tracks:

1. Exact algorithms
2. Heuristic algorithms
3. Kernelization algorithms

https://pacechallenge.org/2021/tracks/



Program Committee:

Leon Kellerhals
Tomohiro Koana
André Nichterlein*
Philipp Zschoche

Technical University of Berlin

PACE 2022: We need your help!

Wanted:
researcher with experience in theory & practice of parameterized algorithms,
to be the program chair of PACE 2022

- Set up challenge tracks in discussion with the steering committee
- Assemble a program committee to help with selection of instances, setting up the evaluation platform, handling submissions, evaluating implementation reports
- Publish an article summarizing the challenge in the IPEC proceedings

Potentially interested? Contact the steering committee!

Steering committee

Édouard Bonnet	LIP, ENS Lyon
Holger Dell	Goethe University Frankfurt and IT University of Copenhagen
Johannes Fichte	Technische Universität Dresden
Markus Hecher	Technische Universität Wien
Bart M. P. Jansen*	Eindhoven University of Technology
Łukasz Kowalik	University of Warsaw
Marcin Pilipczuk	University of Warsaw
Manuel Sorge	Technische Universität Wien

Former members

Thore Husfeldt	(2016-2019)
Petteri Kaski	(2016-2020)
Christian Komusiewicz	(2016-2020)
Frances Rosamond	(2016-2019)
Florian Sikora	(2017-2020)