

Jan van den Brand

Curriculum Vitae

Georgia Institute of Technology
School of Computer Science

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Research Interests

Dynamic Algorithms, Algebraic Algorithms, Convex Optimization

Positions

- 2022 – present **Assistant Professor**, Georgia Institute of Technology (Georgia Tech)
- 2022 **Visiting Researcher**, Max Planck Institute for Informatics
- 2021 – 2022 **Postdoctoral Researcher**, UC Berkeley, also affiliated with
Simons Institute for the Theory of Computing
& Foundations of Data Science Institute (FODSI)

Degrees

- Ph.D. KTH Royal Institute of Technology, Stockholm, 2017 – 2021
PhD in Computer Science
Advisor: Danupon Nanongkai
EATCS Dissertation Award and **SMC Dissertation Award**
- M.Sc. Goethe University Frankfurt, 2015 – 2017
Master of Science in Mathematics
Advisor: Amin Coja-Oghlan
GPA: 1.2 (Scale: 1.0 best, 4.0 worst)
- M.Sc. Goethe University Frankfurt, 2014 – 2016
Master of Science in Computer Science
Advisor: Rudolf Mester
GPA: 1.0 (Scale: 1.0 best, 4.0 worst)
Ferchau Award
- B.Sc. Goethe University Frankfurt, 2011 – 2016
Bachelor of Science in Mathematics
Advisor: Claus P. Schnorr
GPA: 1.1 (Scale: 1.0 best, 4.0 worst)
- B.Sc. Goethe University Frankfurt, 2011 – 2014
Bachelor of Science in Computer Science
Advisor: David Sabel
GPA: 1.0 (Scale: 1.0 best, 4.0 worst)
Ferchau Award

Honors and Awards

- 2022 [EATCS Distinguished Dissertation Award](#)
This annual award promotes and recognizes outstanding dissertations in the field of theoretical computer science. Three dissertations were selected by the committee, based on originality and potential impact on their respective fields and on theoretical computer science.
- 2021 [SMC Prize for Excellent Doctoral Dissertation](#)
Given annually by the Stockholm Mathematics Centre to the two most outstanding dissertations at Stockholm University (SU) and the Royal Institute of Technology (KTH) in the areas of mathematics and theoretical computer science.
- 2020 – 2021 [Google PhD Fellowship](#)
The Google PhD Fellowship Program was created to recognize outstanding graduate students doing exceptional and innovative research in areas relevant to computer science and related fields. I am the first recipient at KTH and in 2020 the fellowship was awarded to only 4 other students in Europe.
- 2015 & 2017 [Ferchau Award \(Masters, 2017\) \(Bachelors, 2015\)](#)
Given to students at Goethe University who graduate with 1.0 (the best possible grade). Three students were given the award in 2017 and 2015.
- 2014 – 2017 [Studienstiftung des deutschen Volkes \(German Academic Scholarship\)](#)
The German Academic Scholarship Foundation is Germany's largest, oldest and most prestigious scholarship foundation. The Studienstiftung awards scholarships to fewer than 0.5% of German students. It is often referred to as Germany's "secret elite university".
- 2013 – 2014 [Deutschlandstipendium \(Germany Scholarship\)](#)
The Deutschlandstipendium supports highly talented students. In addition to academic achievement, the criteria for selecting scholarship recipients include social commitment and personal achievements, such as a student overcoming challenges or obstacles in his or her social or family background.

Invited Talks

- 2023-06-14 Workshop on Modern Techniques in Graph Algorithms, DIMACS at Rutgers University
- 2023-04-27 Max Planck Institute for Informatics
- 2023-01-17 Salzburg University Theory Seminar
- 2023-01-09 EPFL Theory Seminar
- 2022-06-23 Dynamic Algorithms Workshop at STOC'22
- 2021-11-19 CMU Theory Seminar
- 2021-11-11 Stanford CS Theory Lunch
- 2021-10-11 Trimester Program on Discrete Optimization at Hausdorff Institute
- 2021-09-21 ARC Seminar at Georgia Institute of Technology
- 2021-09-08 Aalto CS Theory Seminar, Finland
- 2021-03-19 Seminar on Combinatorics, Games and Optimisation at London School of Economics
- 2020-12-16 Rutgers/DIMACS Theory of Computing Seminar
- 2020-12-11 Michigan-Purdue Theory Seminar
- 2020-03-10 BARC Talk at University of Copenhagen
- 2020-03-03 BARC Talk at University of Copenhagen
- 2019-11-19 Theory Seminar at University of Washington, Seattle
- 2019-10-21 Colloquium on Mathematical Computer Science at Goethe University, Frankfurt
- 2019-06-11 Bertinoro Workshop on Algorithms and Data Structures (ADS)
- 2018-07-19 Algorithmics Seminar at University of Warsaw

Publications

- “A Deterministic Almost-Linear Time Algorithm for Minimum-Cost Flow”
with Li Chen, Maximilian Probst Gutenberg, Rasmus Kyng, Yang P. Liu, Richard Peng, Sushant Sachdeva, and Aaron Sidford.
FOCS 2023.
- “Deterministic Fully Dynamic SSSP and More”
with Adam Karczmarz.
FOCS 2023.
- “Faster High Accuracy Multi-Commodity Flow from Single-Commodity Techniques”
with Daniel Zhang.
FOCS 2023.
- “Dynamic Maxflow via Dynamic Interior Point Methods”
with Yang P. Liu and Aaron Sidford.
STOC 2023.
- “Nearly Optimal Communication and Query Complexity of Bipartite Matching”
with Joakim Blikstad, Yuval Efron, Sagnik Mukhopadhyay and Danupon Nanongkai.
FOCS 2022.
- “Fast Deterministic Fully Dynamic Distance Approximation”
with Sebastian Forster and Yasamin Nazari.
FOCS 2022.
- “Fully-Dynamic Graph Sparsifiers Against an Adaptive Adversary”
with Aaron Bernstein, Maximilian Probst Gutenberg, Danupon Nanongkai, Thatchaphol Saranurak, Aaron Sidford and He Sun.
ICALP, 2022.
- “Faster Maxflow via Improved Dynamic Spectral Vertex Sparsifiers”
with Yu Gao, Arun Jambulapati, Yin Tat Lee, Yang P. Liu, Richard Peng and Aaron Sidford.
STOC, 2022.
- “Minimum Cost Flows, MDPs, and ℓ_1 -Regression in Nearly Linear Time for Dense Instances”
with Yin Tat Lee, Yang P. Liu, Thatchaphol Saranurak, Aaron Sidford, Zhao Song and Di Wang.
STOC, 2021.
- “Breaking the Quadratic Barrier for Matroid Intersection”
with Joakim Blikstad, Sagnik Mukhopadhyay and Danupon Nanongkai.
STOC, 2021.
- “Unifying Matrix Data Structures: Simplifying and Speeding up Iterative Algorithms”
SOSA, 2021. **Best Paper.**
- “Training (Overparametrized) Neural Networks in Near-Linear Time”
with Binghui Peng, Zhao Song and Omri Weinstein.
ITCS, 2021.
- “Bipartite-Matching in Nearly-linear Time on Moderately Dense Graphs”
with Yin Tat Lee, Danupon Nanongkai, Richard Peng, Thatchaphol Saranurak, Aaron Sidford, Zhao Song and Di Wang.
FOCS, 2020. **Invited to the special issue.**

“Solving Tall Dense Linear Programs in Nearly Linear Time”

with Yin Tat Lee, Aaron Sidford and Zhao Song.

STOC, 2020. **Invited to the special issue.**

“A Deterministic Linear Program Solver in Current Matrix Multiplication Time”

SODA, 2020.

“Dynamic Approximate Shortest Paths and Beyond: Subquadratic and Worst-Case Update Time”

with Danupon Nanongkai.

FOCS, 2019.

“Sensitive Distance and Reachability Oracles for Large Batch Updates”

with Thatchaphol Saranurak.

FOCS, 2019.

“Dynamic Matrix Inverse: Improved algorithms and matching conditional lower bounds”

with Danupon Nanongkai and Thatchaphol Saranurak.

FOCS, 2019.

“Instance-Level Segmentation of Vehicles by Deep Contours”

with Matthias Ochs and Rudolf Mester.

ACCV Workshops, 2016.