

# Jan van den Brand

## Curriculum Vitae

Simons Institute  
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### Research Interests

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Dynamic Algorithms, Algebraic Algorithms, Convex Optimization

### Positions

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2021 – ongoing      Postdoctoral Researcher  
Simons Institute at UC Berkeley

### Education and Degrees

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2017 – 2021      KTH Royal Institute of Technology, Stockholm  
PhD in Computer Science  
Advisor: Danupon Nanongkai

2015 – 2017      Goethe University Frankfurt  
Master of Science in Mathematics  
Grade: 1.2 (Scale: 1.0 best, 4.0 worst)  
Thesis: *Conditional Random Fields*  
Advisor: Amin Coja-Oghlan

2014 – 2016      Goethe University Frankfurt  
Master of Science in Computer Science  
Grade: 1.0 (Scale: 1.0 best, 4.0 worst)  
Thesis: *Detection and Segmentation of Vehicles using Convolutional Neural Networks*  
Advisor: Rudolf Mester

2011 – 2016      Goethe University Frankfurt  
Bachelor of Science in Mathematics  
Grade: 1.1 (Scale: 1.0 best, 4.0 worst)  
Thesis: *Factoring Integers via SVP Algorithms*  
Advisor: Claus P. Schnorr

2011 – 2014      Goethe University Frankfurt  
Bachelor of Science in Computer Science  
Grade: 1.0 (Scale: 1.0 best, 4.0 worst)  
Thesis: *A new Dynamically Typed and Imperative Programming Language with Delayed Evaluation*  
Advisor: David Sabel

## Honors and Awards

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- 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.
- 2017              Ferchau Award (Masters)  
Given to students at Goethe University who graduate with 1.0 (the best possible grade). Three students were given the award in 2017.
- 2015              Ferchau Award (Bachelors)  
Given to students at Goethe University who graduate with 1.0 (the best possible grade). Three students were given the award in 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.

## Teaching

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Teaching assistant for the following courses at KTH:

- 2019 – 2020      Software Engineering Fundamentals  
2018 – 2020      Algorithms and Complexity Theory  
2017 – 2020      Advanced Algorithms  
2017 – 2020      Computer Security

Teaching assistant for the following courses at Goethe University:

- 2015 – 2017      Mathematical Mentoring for STE students  
2013 – 2017      Calculus and Linear Algebra in CS  
2014 – 2016      Discrete and Numerical Mathematics in CS  
2015              Discrete and Convex Optimization  
2013              Abstract Algebra and Geometry

## Invited Talks

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- 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  
Other talks include presentations at FOCS’20, STOC’20, SODA’20, and 3 talks at FOCS’19.

## Publications

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“Minimum Cost Flows, MDPs, and  $\ell_1$ -Regression in Nearly Linear Time for Dense Instances”  
with Yin Tat Lee, Yang P. Liu, Thatchaphol Saranurak, Aaron Sidford 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.

## Other Papers

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“Fully-Dynamic Graph Sparsifiers Against an Adaptive Adversary”  
with Aaron Bernstein, Maximilian Probst Gutenberg, Danupon Nanongkai, Thatchaphol Saranurak, Aaron Sidford and He Sun, 2020. In submission.

“The Mutual Information of LDGM codes”  
with Nor Jaafari, 2017.