

QUICO SPAEN

Expertise in Operations Research and Machine Learning

CONTACT DETAILS

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EDUCATION

University of California, Berkeley

PhD in Industrial Engineering & Operations Research 2014 – May 2019 (expected)
MSc in Computer Science - Artificial Intelligence, GPA: 4.0 / 4.0 2016 – May 2019 (expected)
MSc in Industrial Engineering & Operations Research, GPA: 4.0 / 4.0 2014 – 2015

Research interest: Combinatorial Optimization, Machine Learning, Transportation, Deep Learning, and Reinforcement Learning.
Advisor: Prof. Dorit Hochbaum (PhD), Prof. John Canny (MSc in Computer Science)

Erasmus University Rotterdam

Pre-master Econometrics & Operations Research, GPA: 9.3/10 2013 – 2014

Amsterdam University College (University of Amsterdam & VU University Amsterdam)

Bachelor of Science, Liberal Arts and Sciences, Summa Cum Laude with GPA: 3.94 / 4.0 2010 – 2013

EXPERIENCE

UC Berkeley

Teaching Positions 09/2014 – Current

- Instructor for Linear Programming & Network Flows (IEOR 162) in Spring 2017.
Teaching evaluation: 4.94 / 5.0. Served as teaching assistant in Fall 2015 and Spring 2016.
- Teaching assistant for Network Flows and Graphs (IEOR 266) in Fall 2014-2018.
- Teaching assistant for Portfolio and Risk Analytics (IEOR 224) in Spring 2018.

Winner of UC Berkeley's outstanding GSI award in 2016.

Research Assistant 07/2018 – Current

Research assistant for Prof. Hochbaum.

Uber Technologies Inc.

Data Scientist Intern - Marketplace Optimization Data Science 05/2016 – 08/2016

- Evaluated the accuracy of the estimated time to arrival (ETA) prediction model.
- Developed new models and metrics to improve ETA estimate.
- Saved \$2.5 million by trading off computational load and prediction accuracy for ETA prediction.
- Designed and estimated a hazard model for the probability of a driver ending its shift based on censored data.

MIcompany

Student Data Scientist 07/2013 – 07/2014

The consultant MIcompany is the Dutch market leader in Marketing Data Analytics.

- Developed forecasting models for the Dutch National Railways and the insurance company Achmea.
- Estimated a descriptive model to identify key drivers for customer satisfaction at the Dutch National Railways.
- Responsible for updating the management dashboards of the Dutch National Railways.
- Developed & presented a time series forecasting business case for the University of Groningen.
- Prepared presentations for the executive board of the Dutch National Railways.

Royal Dutch Airlines (KLM)

Intern – KLM Decision Support 06/2013 – 07/2013

- Identified the leading causes of last-minute gate changes at Amsterdam Schiphol Airport using statistical analysis.
- Proposed business solutions to prevent last-minute gate changes.
- Presented our recommendations to KLM's VP of Passenger services.

CURRENT RESEARCH PROJECTS

- **Routing and Dispatching of Location-based Resources**
Designing algorithms for real-time dispatching of location-based resources such as taxis, maintenance crews, and emergency services.
- **Detection of Aberrant Agents in Networks**
Detection of aberrant agents (e.g. fake news bots) in networks using network-based optimization.
- **Posterior Sampling with Stochastic Gradient Descent**
Adapt stochastic gradient descent for deep learning to sample model parameters according to the posterior distribution.

PUBLICATIONS

- M. Chang, D. S. Hochbaum, **Q. Spaen**, and M. Velednitsky. DISPATCH: An Optimally-Competitive Algorithm for Online Perfect Bipartite Matching with i.i.d. Arrivals. Accepted at Workshop on Approximation and Online Algorithms, Helsinki, 2018.
- C. T. Caro, **Q. Spaen**, and M. Velednitsky. The Dimension of Signed Graph Valid Drawing, 2017. *Submitted to Discrete & Computational Geometry*.
- P. Baumann, D. S. Hochbaum and **Q. Spaen**. High-Performance Geometric Algorithms for Sparse Computation in Big Data Analytics, *IEEE International Conference on Big Data*, pp. 546-555, Boston, 2017.
- **Q. Spaen**, D. S. Hochbaum, & R. Asín-Achá. HNCcorr: A Novel Combinatorial Approach for Cell Identification in Calcium-Imaging Movies. *arXiv preprint arXiv:1703.01999*, 2017. *Submitted to eNeuro*.
- P. Baumann, D. S. Hochbaum and **Q. Spaen**. Sparse-Reduced Computation: Enabling Mining of Massively-Large Data Sets. *International Conference on Pattern Recognition Applications and Methods*, pp. 224-231, Rome, 2016.

HONORS & AWARDS

- **IEOR Faculty Fellowship** - Highest award for IEOE graduate students, UC Berkeley (2016)
- **Outstanding Graduate Instructor**, UC Berkeley (2016)
- **Prince Bernhard Fellowship** - \$ 12,500 stipend, Prins Bernhard Cultuurfonds (2015)
- **IEOR First-year Fellowship** - Tuition and stipend for first year of PhD, UC Berkeley (2014)
- **Summa Cum Laude**, Amsterdam University College (2013)

PRESENTATIONS

- High-Performance Geometric Algorithms for Sparse Computation in Big Data Analytics, *IEEE International Conference on Big Data*, Boston, 2017.
- HNCcorr: A Novel Combinatorial Approach for Cell Identification in Calcium Imaging Movies, *INFORMS Annual Meeting*, Houston, 2017.
- Algorithms for automatic segmentation and signal extraction in calcium imaging data, *IEOR Advisory Board Meeting*, Berkeley, 2016.

SERVICE

- IEOE representative to the UC Berkeley's Graduate Student Government (2015-2018).
- Chair of IEOE Graduate Student Group (2017-2018)
- Reviewer for ACM Symposium on Discrete Algorithms - SODA (2017).
- Reviewer for IEEE Transactions on Big Data (2016).

PROGRAMMING EXPERIENCE

Programming: Python, Matlab, C, Git

Machine learning: Tensorflow, Keras, Sklearn

Optimization: Gurobi, CPLEX, AMPL

Data: SQL, Pandas, Spark