

JOHN GUNNAR CARLSSON  
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*University of Southern California*  
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## Education

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- 2009      INSTITUTE FOR COMPUTATIONAL AND MATHEMATICAL ENGINEERING (ICME)  
STANFORD UNIVERSITY  
*Ph.D. in Computational and Mathematical Engineering*  
*Dissertation: “Map segmentation algorithms for geographic resource allocation problems”*  
*Adviser: Yinyu Ye*
- 2005      HARVARD COLLEGE  
*A.B. in Mathematics and Music with honors*

## Positions held

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- 2017–      Kellner Family Associate Professor, University of Southern California
- 2015–17    Assistant Professor, University of Southern California
- 2009–14    Assistant Professor, University of Minnesota

## Research publications and pre-prints

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(names in **bold** denote students)

- 2019      Carlsson, John Gunnar, and **Ye Wang**. “Distributions of maximum spread subject to Wasserstein distance constraints.” *Journal of the Operational Research Society*, to appear.
- 2018      Carlsson, John Gunnar, **Mehdi Behroozi**, and Kresimir Mihic. “Wasserstein distance and the distributionally robust TSP.” *Operations Research* 66.6 (2018): 1603-1624.
- 2018      Carlsson, John Gunnar, and **Siyan Song**. “Coordinated logistics with a truck and a drone.” *Management Science* 64.9 (2018): 3971-4470.
- 2017      Carlsson, John Gunnar, and **Mehdi Behroozi**. “Worst-case demand distributions in vehicle routing.” *European Journal of Operational Research* 256.2 (2017): 462-472.
- 2016      Carlsson, John Gunnar, **Mehdi Behroozi**, **Xiangfei Meng**, and **Raghuveer Devulapalli**. “Household-level economies of scale in transportation.” *Operations Research* 64.6 (2016): 1372-1387.
- 2016      Carlsson, John Gunnar, Erik Carlsson, and **Raghuveer Devulapalli**. “Shadow prices in territory division.” *Networks and Spatial Economics* 16.3 (2016): 1-39.

- 2016 Carlsson, John Gunnar, **Mehdi Behroozi**, and **Xiang Li**. “Geometric partitioning and robust ad-hoc network design.” *Annals of Operations Research* 238.1 (2016): 41-68.
- 2015 Carlsson, John Gunnar, and **Fan Jia**. “Continuous facility location with backbone network costs.” *Transportation Science* 49.3 (2015): 433-451.
- 2015 Carlsson, John Gunnar, Benjamin Armbruster, **Rahul Saladi**, and **Haritha Bellam**. “A bottleneck matching problem with edge-crossing constraints.” *International Journal of Computational Geometry and Applications* 25.4 (2015): 245-261.
- 2013 Carlsson, John Gunnar, and **Fan Jia**. “Euclidean hub-and-spoke networks.” *Operations Research* 61.6 (2013): 1360-1382.
- 2013 Carlsson, John Gunnar, and Erick Delage. “Robust partitioning for stochastic multivehicle routing.” *Operations Research* 61.3 (2013): 727-744.
- 2013 Lum, P. Y., G. Singh, A. Lehman, T. Ishkanov, Mikael Vejdemo-Johansson, M. Alagappan, J. Carlsson, and G. Carlsson. “Extracting insights from the shape of complex data using topology.” *Scientific Reports* 3 (2013).
- 2013 Carlsson, John Gunnar, **Fan Jia**, and **Ying Li**. “An approximation algorithm for the continuous  $k$ -medians problem in a convex polygon.” *INFORMS Journal on Computing* 26.2 (2013): 280-289.
- 2013 Carlsson, John Gunnar, and Jianming Shi. “A linear relaxation algorithm for solving the sum-of-linear-ratios problem with lower dimension.” *Operations Research Letters* 41.4 (2013): 381-389.
- 2012 Carlsson, John Gunnar, and **Raghuveer Devulapalli**. “Dividing a territory among several facilities.” *INFORMS Journal on Computing* 25.4 (2012): 730-742.
- 2012 Carlsson, John Gunnar. “Dividing a territory among several vehicles.” *INFORMS Journal on Computing* 24.4 (2012): 565-577.
- 2010 Carlsson, John Gunnar, Benjamin Armbruster, and Yinyu Ye. “Finding equitable convex partitions of points in a polygon efficiently.” *ACM Transactions on Algorithms (TALG)* 6.4 (2010): 72.

### Refereed conference proceedings

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(names in **bold** denote students)

- 2014 **Devulapalli**, **Raghuveer**, **Mikael Quist**, and John Gunnar Carlsson. “Spatial partitioning algorithms for data visualization.” *Visualization and Data Analysis (VDA), 2014 IS&T/SPIE Conference on*. (pp. 90170V-1-90170V-8).
- 2013 Carlsson, John Gunnar, Erik Carlsson, and **Raghuveer Devulapalli**. “Balancing workloads of service vehicles over a geographic territory.” *Intelligent Robots and Systems (IROS), 2013 IEEE/RSJ International Conference on* (pp. 209-216).

### Book chapters

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(names in **bold** denote students)

- 2018 Carlsson, John Gunnar, and **Mehdi Behroozi**. “Computational geometric approaches to equitable districting: a survey”, to appear in *Optimal Districting and Territory Design: Models, Algorithms, and Applications*, Springer International Series in Operations Research & Management Science

- 2015 *Devulapalli, Raghuvver, Neil Peterson*, and John Gunnar Carlsson. “Data visualization using weighted Voronoi diagrams.” *Geo-Intelligence and Visualization through Big Data Trends*. IGI Global, 2015: 181-204.
- 2007 Carlsson, John Gunnar, Dongdong Ge, Arjun Subramaniam, and Yinyu Ye. “Solving the min-max multi-depot vehicle routing problem.” *Lectures on Global Optimization. Fields Institute Communications* 55 (2009): 31-46.

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### Sponsored research projects

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- 2020-21 “Real-world applications of computational geometry in complex routing and logistical problems”, DARPA Lagrange Program. \$110,282.
- 2020 “The ‘sidekick’ routing paradigm for VMT reduction and improved accessibility”, METTRANS. \$96,793.
- 2018–19 “Computational geometric approaches to geospatial optimization problems.” DARPA (Lagrange Program), \$348,737. Lead P.I. (with Joseph S. B. Mitchell, SUNY Stony Brook, Co-P.I.)
- 2017–19 “Real-world implementations of geographic resource allocation solutions.” DoD (DURIP Program), \$87,278. P.I.
- 2016–19 “Geometric algorithms and structures that solve hard optimization problems.” NSF, \$290,813. P.I.
- 2016–19 “Online and decentralized algorithms for ‘horsefly’ problems.” ONR, \$390,171. P.I.
- 2015–18 “Allocating geographic resources optimally (AGRO).” AFOSR, \$372,692. P.I.
- 2015–16 “Quantifying the impact of next-generation modes of delivery.” METTRANS UTC, \$34,033. P.I.
- 2014–16 “Local and global phenomena in dynamic resource allocation.” ONR, \$123,475. P.I.
- 2013–14 “Dynamic and decentralized geographic resource allocation.” ONR, \$120,865. P.I.
- 2012–15 “Strategically allocating resources in a geographic environment (SARGE).” DARPA, \$292,800. P.I.
- 2012–15 “Segmenting a map to allocate resources in a territory (SMART).” NSF, \$179,500. P.I.
- 2012–13 “Online and decentralized algorithms for map segmentation problems.” ONR, \$111,562. P.I.
- 2011–12 “Region partitioning algorithms for geographic resource allocation.” UMN Grant-in-Aid program, \$31,153. P.I.
- 2011 “A fast, auction-based algorithm for paratransit vehicle assignment.” UMN Center for Transportation Studies, \$9,339. P.I.

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### Honors and awards

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- 2019 Northrop Grumman Teaching Award
- 2017 Kellner Family Early Career Chair
- 2017 National Academy of Engineering Frontiers of Engineering Participant
- 2016 *Popular Science* magazine’s *Brilliant 10*, “The man who re-routes the world using geometry”

- 2015 AFOSR Young Investigator Prize
- 2013 INFORMS Computing Society (ICS) Prize
- 2013 INFORMS Junior Faculty Interest Group (JFIG) Paper Competition Finalist
- 2012 DARPA Young Faculty Award
- 2010 First Prize, INFORMS Interactive Session Competition
- 2008 Departmental Teaching Award, Institute for Computational and Mathematical Engineering (ICME), Stanford University

#### **Awards won by students**

- 2017 TSL Dissertation Prize: Mehdi Behroozi
- 2017 Finalist, Dantzig Dissertation Award: Mehdi Behroozi
- 2017 Third Prize, IISE Pritsker Doctoral Dissertation Award: Mehdi Behroozi
- 2016 Second Prize, INFORMS Nicholson Prize: Mehdi Behroozi, Xiangfei Meng, Raghuveer Devulapalli, for the paper “Household-level economies of scale in transportation”
- 2016 Honorable mention, INFORMS SOLA Dissertation Prize: Fan Jia
- 2016 Second Prize, IIE Doctoral Colloquium Poster Competition: Mehdi Behroozi
- 2012 Third Prize, INFORMS Interactive Session Competition: Raghuveer Devulapalli:

#### **Invited talks**

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- 2018 “Continuous approximation models for some modern logistical problems.” Northwestern University, IEMS Seminar, May 14
- 2017 “New problems in modern logistical systems.” University of Toronto, Rotman Business School OM Seminar, April 7
- 2016 “Applying computational geometry to modern transportation problems.” Stanford University Institute for Computational and Mathematical Engineering, External Partners Meeting, November 11
- 2016 “Your first few years.” Doctoral Colloquium, IISE Annual Conference, Anaheim, May 21
- 2016 “The generalized TSP and trip chaining.” Plenary talk, IWSSSCM3 Conference, Hong Kong, January 7
- 2015 “New continuous approximation models for transportation.” Departmental Colloquium Seminar, Georgia Tech Department of Industrial and Systems Engineering, December 2
- 2014 “Allocating geographic resources optimally.” Departmental Seminar, University of Southern California Department of Industrial and Systems Engineering, February 24
- 2014 “Allocating geographic resources optimally.” Departmental Seminar, University of Washington Department of Industrial and Systems Engineering, February 18
- 2014 “Allocating geographic resources optimally.” Departmental Seminar, Columbia University Department of Industrial Engineering and Operations Research, February 13

- 2014 “Allocating geographic resources optimally.” Operations/Management Science Workshop, Chicago Booth School of Business, January 21
- 2013 “Allocating geographic resources optimally.” Departmental Seminar, Naval Postgraduate School Department of Operations Research, October 31
- 2013 “Big data in business management and development.” Center for Professional Development, Stanford University, August 29
- 2013 “Geographic resource allocation and continuous location theory.” Departmental Seminar, Department of Technology and Information Management, UC Santa Cruz, April 22
- 2013 “Geographic partitioning and continuous location problems.” Scientific and Statistical Computing Seminar, University of Chicago, February 7
- 2012 “Equitable region partitioning among several agents.” Departmental Seminar, Center for Control, Dynamical Systems, and Computation (CCDC), September 17
- 2012 “Dividing a territory among several facilities.” Interdisciplinary Transportation Student Organization (ITSO) Seminar, University of Minnesota, March 20
- 2011 “Dividing a territory among several agents.” Departmental Seminar, Institute for Computational and Mathematical Engineering, Stanford University, August 3
- 2011 “Practical applications of subadditive Euclidean functional theory.” Departmental Seminar, Department of Mathematics, Lehigh University, April 13
- 2011 “Algorithms for optimally dividing a territory.” Departmental Seminar, Department of Operations Management, Sauder School of Business, University of British Columbia, March 7

## Service

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Associate Editor, *Operations Research*

Associate Editor, *Management Science*

Associate Editor, *Transportation Science*

Associate Editor, *Computers and Operations Research*

Referee for *Operations Research*, *Management Science*, *M&SOM*, *INFORMS Journal on Optimization*, *Transportation Research Part B*, *Transportation Science*, *Algorithmica*, *European Journal of Operational Research*, *Computers and Operations Research*, *IEEE Transactions on Robotics*, *Journal of Dynamic Systems, Measurement, and Control*, and *IEEE Transactions on Intelligent Transportation Systems*

## Affiliations

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American Indian Science and Engineering Society (AISES), INFORMS, SIAM

## Doctoral students

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- 2018      Xiangfei Meng  
Dissertation: “Asymptotic analysis of the generalized traveling salesman problem and its application”  
Engineer, Snap Inc.
- 2018      Siyuan Song  
Dissertation: “Package delivery with trucks and UAVs”  
Engineer, Facebook
- 2018      Ye Wang  
Dissertation: “Applications of Wasserstein distance in distributionally robust optimization”  
Engineer, Facebook
- 2016      Mehdi Behroozi  
Dissertation: “Robust solutions for geographic resource allocation problems”  
Assistant Professor, Department of Mechanical and Industrial Engineering, Northeastern University
- 2015      Fan Jia  
Dissertation: “On continuous connected facility location problems”  
Systems Engineer, AVIC Xi’an Flight Automatic Control Research Institute
- 2014      Raghuveer Devulapalli  
Dissertation: “Geometric partitioning algorithms for fair division of geographic resources”  
Research Staff, Computational Lithography Group, Intel Inc.