

Curriculum Vitae

BIOGRAPHICAL INFORMATION

A. Identifying Data

Ram Rajagopal

Assistant Professor

Department of Civil and Environmental Engineering

Department of Electrical Engineering (by Courtesy)

Fellow, Precourt Institute for Energy

Member, Emmet Interdisciplinary Program in Environment and Resources

B. Academic History

Colleges and Universities

12/31/2009	University of California, Berkeley Ph.D., Electrical Engineering and Computer Sciences M.A., Statistics
07/31/2002	University of Texas, Austin M.S.E.E., Telecommunications and Information Systems
05/31/1999	Federal University of Rio de Janeiro, Brazil M.Sc., Electrical Engineering (Signal Processing) B.S. Electrical Engineering (with Honors)

C. Employment Record

ACADEMIC EMPLOYMENT

01/06/2011- Current	Assistant Professor Department of Civil and Environmental Engineering Stanford University
01/01/2010- 01/01/2011	Post-doctoral Scholar University of California, Berkeley, CA
08/01/2003- 12/31/2009	Graduate Student Researcher University of California, Berkeley, Berkeley, CA
05/21/2004- 08/08/2005	Visiting Research Associate IBM Research (TJ Watson), Hawthorne, NY
01/10/1994- 08/31/1997	Research Student National Scholarship, COPPE/UFRJ, Brazil

NONACADEMIC EMPLOYMENT

08/01/2009- Present	Co-Founder, Verivolt, LLC.
08/01/2002- 12/25/2009	Industrial Research for four companies Sensys Networks, Inc., 360 Fresh, Inc., Origin, LLC, Petrobras, S. A., Berkeley, CA
12/01/1999- 08/01/2002	DSP/Vision Software Engineer National Instruments Corp., Austin, TX
12//17/1998- 12//01/1999	Applications Engineer National Instruments Corp., Austin, TX
06//01/1997 12//01/1998	Analyst (Trainee then Employee) Pactual Asset Management, UBS Pactual, Brazil
06//01/1996- 12//12/1996	Software Consultant PETROBRAS, Brazil

D. Awards and Honors/Professional Affiliations

AWARDS AND HONORS

2016	Best Student Paper Award, Engineering Mechanics Institute 2016
2016	NSF Career Award
2015	Associated Editor, IEEE Transactions on Smart Grid
2013	Keynote Speaker at IEEE Global Conference on Signal and Information Processing (Smart Grids)
2013	Guest Editor for Journal of Selected Areas in Communications (JSAC) Special Issue on Smart Grids
2013	Guest Editor for IEEE Sensors Journal – Special Issue on Sensing Technologies and Urban Infrastructure
2013	Track Chair for IEEE SmartGridComm, 2013
2013	PES Meeting Best Papers
2001	Regents Fellowship, University of California, Berkeley
2000	Makhoul Conjecture Challenge, IEEE Signal Processing Magazine
1998	National Research Council Master's scholarship
1998	First Place in UFRJ University scientific research competition
1997	Unisys Master Prize Innovation
1994-1997	National Research Council Undergraduate Research scholarship

1994 First place in CERN-UFRJ summer research project competition

PROFESSIONAL AFFILIATIONS

2011-Present Reviewer for IEEE Transactions in Power Systems
2011-Present Reviewer for IEEE Transactions in Smart Grid
2007-Present Reviewer for IEEE Transactions on Automatic Control
2008-Present Reviewer for Transportation Research Part C
2009-Present Reviewer for Journal of Computing in Civil Engineering
2007-Present Reviewer for IEEE Transactions in Intelligent Transportation Systems
2007-Present Reviewer for IEEE Transactions in Signal Processing
2007-2010 Reviewer for IEEE Transactions in Information Theory
2008-2009 Reviewer for Journal of Infrastructure Systems
2009-2010 Reviewer for ACM Transactions in Networking

PROFESSIONAL MEMBERSHIPS

2009-Present American Society for Civil Engineering (ASCE)
2007-Present Association of Computing Machines (ACM)
1998-Present Institute of Electrical and Electronics Engineers (IEEE)

E. Scholarly Publications

BIBLIOGRAPHICAL INFORMATION

There are three practices in naming authors in publications: (a) students are named first and faculty are named last, (b) authors are sorted in alphabetic order in some publications, and (c) Dr. Rajagopal's thesis publications done jointly with a company, the University members were listed last due to IP arrangements.

Refereed Publications

1. **Kwac, J.**, Flora, J. and Rajagopal, R., "Household energy consumption segmentation using hourly data," *IEEE Transactions on Smart Grid*, 5(1):420–430, 2014.
2. **Albert, A.** and Rajagopal, R., "Smart meter driven segmentation: What your consumption says about you," *IEEE Transactions on Power Systems*, 28(4):4019–4030, 2013.

3. **Sevlian, R.** and Rajagopal, R., “Detection and statistics of wind power ramps,” *IEEE Transactions on Power Systems*, 28(4):3610–3620, 2013.
4. Rajagopal, R., Bitar, E., Wu, F., and Varaiya, P., “Risk-limiting dispatch for integrating renewable power,” *International Journal of Electrical Power & Energy Systems*, 44(1):615–628, 2013.
5. Noh, H.Y., Rajagopal, R., and Kiremidjian, AS, “Sequential structural damage diagnosis algorithm using a change point detection method,” *Journal of Sound and Vibration*, 332(24):6419–6433, 2013.
6. **Kavousian, A.** and Rajagopal, R., and Fischer, M., “Determinants of residential electricity consumption: Using smart meter data to examine the effect of climate, building characteristics, appliance stock, and occupants’ behavior,” *Energy*, 55(15):184–194, 2013.
7. **Kavousian, A.** and Rajagopal, R., “Data-Driven Benchmarking of Building Energy Efficiency Utilizing Statistical Frontier Models,” *Journal of Computing in Civil Engineering*, 28(1): 79–88, 2013.
8. Bitar, E.Y., Rajagopal, R., Khargonekar, P., and Poolla, K., “Bringing wind energy to market,” *IEEE Transactions on Power Systems*, 27(3):1225–1235, 2012.
9. Krause, A., Rajagopal, R., Gupta, A., and Guestrin, C., “Simultaneous optimization of sensor placements and balanced schedules,” *IEEE Transactions on Automatic Control*, (99): 2390–2405, 2011.
10. Kwong, K., Kavalier, R., Rajagopal, R., and Varaiya, P., “Real-time measurement of link vehicle count and travel time in a road network,” *IEEE Transactions on Intelligent Transportation Systems*, 11(4): 814–825, 2010. See (c) above.
11. Rajagopal, R. and Wainwright, M. J., “Network-based consensus averaging with general noisy channels,” *IEEE Transactions on Signal Processing*, 59(1):373–385, 2011.
12. Bhamidi, S., Rajagopal, R., and Roch, S., “Network delay inference from additive metrics,” *Random Structures & Algorithms*, 37(2): 176–203, 2010. (authors in alphabetic order).
13. Kwong, K., Kavalier, R., Rajagopal, R., and Varaiya, P. “Arterial travel time estimation based on vehicle reidentification using wireless magnetic sensors,” *Transportation Research Part C: Emerging Technologies*, 17(6):586–606, 2009. See (c) above.
14. Rajagopal, R., Ramamoorthy, S., Wenzel, L., and Andrade, H. A., “A Rapid Prototyping Tool for Embedded, Real-Time Motion Control Algorithms,” *EURASIP Journal on Embedded Systems*, Article ID 162747 (14 total pages),

doi:10.1155/2008/162747, 2008.

15. Ramamoorthy, S., Rajagopal, R., and Wenzel, L., “Low-discrepancy curves: algorithms and applications,” *Robotica* (Special Issue on Geometry in Robotics), Vol. 26, pp. 503–512, 2008.
16. Kaskiris, C., Jain, R., Rajagopal, R., and Varaiya, P., “Combinatorial Auction Bandwidth Trading: An Experimental Study, Experiments in Economic Sciences: New Approaches to Solving Real-world Problems,” *Lecture Notes in Economics and Mathematical Systems*, Springer, pp. 181–186, 2007.
17. Wenzel, L., Rajagopal, R., and Nair, D., “Induced Well-Distributed Sets in Riemannian Spaces,” *ACM Transactions on Mathematical Software*, Vol. 29, No. 1, pp. 82–94, 2003.
18. Duarte, Jr., A. M. and Rajagopal, R., “Optimal Scenario Based Currency Overlay,” *The Journal of Portfolio Management*, Vol. 24, No. 4, pp. 51-59, 1999.

Refereed Publications in Press/Accepted

1. Rajagopal, R., Tse, D. and Zhang, B., “Network risk limiting dispatch: Optimal control and price of uncertainty,” *IEEE Transactions on Automatic Control* (accepted), 2013.
2. **Albert, A.** and Rajagopal, R., “Thermal profiling of residential energy consumption using smart meter data,” *IEEE Transactions on Power Systems*, (accepted), 2014.
3. Qian, Z. S. and Rajagopal, R., “Optimal occupancy-driven parking pricing under demand uncertainties and traveler heterogeneity: a stochastic control approach,” *Transportation Research Part B* (accepted), 2013.
4. Qian, Z. S. and Rajagopal, R., “Optimal dynamic pricing for morning commute parking with information provision,” *Transportation Research Part C* (accepted), 2013.
5. **O’Brien G.** and Rajagopal, R., “Scheduling Non-Preemptive Deferrable Loads,” *IEEE Transactions on Power Systems* (accepted), 2014.
6. Liao, Y. , Mollineaux, M., Hsu, R., Bartlett, R., Singla, A., Raja, A. Bajwa, R. and Rajagopal, R., “SnowFort: An Open Source Wireless Sensor Network for Data Analytics in Infrastructure and Environmental Monitoring”, *IEEE Sensors Journal Special Issue on Sensing Technologies for Intelligent Urban Infrastructures* (accepted), 2014.

7. Zhao, Y., **Qin, J.**, Rajagopal, R., Goldsmith, A. and Poor, H.V., “Wind Aggregation Via Risky Power Markets”, *IEEE Transactions on Power Systems* (accepted), 2014.
8. **Qin, J.**, Chow, Y., Yang, J., Rajagopal, R., “Distributed Online Modified Greedy Algorithm for Networked Storage Operation under Uncertainty”, *IEEE Transactions on Smart Grid* 2015.
9. Zhang, B., Johari, R. and Rajagopal, R., Competition and Coalition Formation of Renewable Power Producers, *IEEE Transactions on Power Systems*, 2015.
10. **Qin, J.**, Chow, Y., Yang, J., Rajagopal, R., “Online Modified Greedy Algorithm for Storage Control under Uncertainty”, *IEEE Transactions on Power Systems*, 2015.
11. Qian, Z. S. and Rajagopal, R., “Optimal parking pricing in general networks with provision of occupancy information,” *Transportation Research Part B*, 2014.
12. I. Yang, S. A. Burden, R. Rajagopal, S. Shankar Sastry, C. J. Tomlin, “Approximation algorithms for optimization of combinatorial dynamical systems”, *IEEE Transactions on Automatic Control*, 2016, forthcoming.

Refereed Publications in Review

1. Kwac, J. and Rajagopal, R., “Lifestyle model of residential energy consumption,” *IEEE Transactions on Power Systems* (revising), 2014.
2. **Qin, J.**, Su, H., and Rajagopal, R., “Risk limiting dispatch with fast storage,” *IEEE Transactions on Automatic Control* (revising), 2013.
3. Rajagopal, R., Nguyen, X., Ergen, S. C., and Varaiya, P., “Simultaneous sequential detection of multiple interacting faults,” *IEEE Transactions on Automatic Control* (revising), 2013.
4. **Sevlian, R.** and Rajagopal, R., “Short-term electricity load forecasting on varying levels of aggregation,” *IEEE Transactions on Power Systems*, (revising), 2014.
5. **Y. Yu** and R. Rajagopal. Transmission congestion management in electricity markets with high penetration of wind power. *Energy Economics* (revising), 2013.
6. Y. Weng, **Y. Liao**, and R. Rajagopal, “Distributed Energy Resources Connectivity Identification via Graphical Modeling”, *IEEE Transactions on Power Systems*, in revision.

Refereed Conference/Symposia Proceedings

1. Y. Liao, Y. Weng, R. Rajagopal, "Urban distribution grid topology reconstruction via Lasso", *IEEE Power Energy Society General Meeting (PES-GM)* at Boston, MA, July 17 - 21, 2016
2. Y. Liao, Y. Weng, M. Wu, R. Rajagopal, "Distribution grid topology reconstruction: an information theoretic approach", *47th North American Power Symposium (NAPS2015)* at Charlotte, NC, October 4 - 6, 2015.
3. A. Gupta, R. Jain and R. Rajagopal, "Scheduling, pricing, and efficiency of non-preemptive flexible loads under direct load control", 2015 53rd Annual Allerton Conference on Communication, Control, and Computing (Allerton)
4. D. Kalathil, R. Rajagopal, "Online Learning for Demand Response", Proceedings of Allerton Conference on Communications, Control and Computing, 2015
5. **Patel, S., Sevlian, R.,** Zhang, B. and Rajagopal, R., "Aggregation for Load Servicing", PES Meeting 2014.
6. **Albert, A.** and Rajagopal, R., "Building dynamic thermal profiles of energy consumption for individuals and neighborhoods," *IEEE International Conference on Big Data*, pages 723–728. IEEE, 2013.
7. **Kwac, J.** and Rajagopal, R., "Demand response targeting using big data analytics," *IEEE International Conference on Big Data*, pages 683–690. IEEE, 2013.
8. **Kwac, J.,** Tan, CW, Sintov, N., Flora, J. and Rajagopal R., "Utility customer segmentation based on smart meter data: Empirical study," *IEEE International Conference on Smart Grid Communications (SmartGridComm)*, pages 720–725. IEEE, 2013.
9. **Sevlian, R.** and Rajagopal, R., "Value of aggregation in smart grids," *IEEE International Conference on Smart Grid Communications (SmartGridComm)*, pages 714–719. IEEE, 2013.
10. Zhao, Y.*, **Qin, J.***, Rajagopal, R., Goldsmith, A. and Poor, H.V, "Risky power forward contracts for wind aggregation," *49th Annual Allerton Conference on Communication, Control, and Computing*, pages 1-8, Allerton, IL 2013. (*Equal contributions).
11. Zhao, Y.*, **Sevlian, R.***, Rajagopal, R., Goldsmith, A., and Poor, H.V., "Outage detection in power distribution networks with optimally-deployed power flow sensors," *2013 IEEE Power and Energy Society General Meeting (PES) [PES Best Papers]*, pages 1–5, IEEE, 2013. (*Equal contributions.)
12. Rajagopal, R., Tse, D. and Zhang, B. "Risk limiting dispatch in congested networks," *Proceedings of the Control and Decision Conference (CDC)*, pages 283–284. IEEE, 2013. (Authors listed alphabetically.)
13. **Qin, J.** and Rajagopal, R., "Dynamic Programming Solution to Distributed

- Storage Operation and Design,” *2013 IEEE Power and Energy Society General Meeting (PES)*, pages 1-5, 2013.
14. **Yu, Y.** and Rajagopal, R., “Financial transmission rights perform well in power markets with high penetration of wind energy?” *2013 IEEE Power and Energy Society General Meeting (PES)*, pages 1-6, IEEE, 2013.
 15. Bajwa, R., Rajagopal, R., Coleri, E., Varaiya, P., and Flores, C., “In-pavement wireless weigh-in-motion,” *Proceedings of the 12th International Conference on Information Processing in Sensor Networks*, pages 103–114, 2013.
 16. **Mollineaux, M.** and Rajagopal R., “Sequential detection of progressive damage,” *SPIE Smart Structures and Materials+ Nondestructive Evaluation and Health Monitoring*, pages 86920U–86920U. International Society for Optics and Photonics, 2013.
 17. **Qin, J.**, Su, H. and Rajagopal, R., “Storage in risk limiting dispatch: Control and approximation,” *Proceedings of the 32nd American Control Conference (ACC)*, 2013, pages 4202–4208. IEEE, 2013.
 18. Noh, H.Y. and Rajagopal, R., “Data-driven forecasting algorithms for building energy consumption,” *SPIE Smart Structures and Materials+ Nondestructive Evaluation and Health Monitoring*, pages 86920T. International Society for Optics and Photonics, 2013.
 19. **O’Brien G.** and Rajagopal, R., “A method for automatically scheduling notified deferrable loads,” *Proceedings of the 32nd American Control Conference (ACC)*, pages 5080–5085. IEEE, 2013.
 20. **O’Brien G.**, El Gamal, A., and Rajagopal, R., “Efficient computation of shapley values for demand response programs,” *Proceedings of the 4th ACM e-Energy*, pages 283–284. ACM, 2013.
 21. Qian, S. and Rajagopal, R., “Optimal stochastic control for parking systems: occupancy-driven parking pricing,” *Proceedings of the Control and Decision Conference (CDC)*, pages 7771–7776. IEEE, 2013.
 22. Qian, Z.S. and Rajagopal, R., “Optimal parking pricing in general networks with provision of occupancy information,” *Procedia-Social and Behavioral Sciences*, 80:779–805, 2013.
 23. **Qin, J.**, Sevlian, R., Varodayan, D., and Rajagopal, R., “Optimal Electric Energy Storage Operation,” *2012 IEEE Power and Energy Society General Meeting (PES)*, pages 1-6, IEEE, 2012.
 24. Rajagopal, R., Bitar, E., Wu, F., and Varaiya, P., “Risk limiting dispatch of wind power,” *Proceedings of the 31st American Control Conference (ACC)*, 2012, pages 4417–4422. IEEE, 2012.

25. Noh, H. Y., Rajagopal, R., and Kiremidjian, A. S., "Damage diagnosis algorithm using a sequential change point detection method with an unknown distribution for damage," *SPIE Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems*, pages 834507, International Society for Optics and Photonics, 2012.
26. Bitar, E., Khargonekar, P., Poolla, K., Rajagopal, R., Varaiya, P., and Wu, F., "Selling random wind," *2012 45th Hawaii International Conference on System Science (HICSS)* [Best paper runner up], pages 1931–1937. IEEE, 2012. (authors listed alphabetically).
27. R. Rajagopal, J. Bialek, C. Dent, R. Entriken, F. Wu, and P. Varaiya. "Risk limiting dispatch: Empirical study," *12th International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)*, pages 1-6, Istanbul, Turkey, 2012.
28. Bitar, E.Y., Rajagopal, R., Khargonekar, P., and Poolla, K., "The role of co-located storage for wind power producers in conventional electricity markets," *Proceedings of the 30th IEEE American Control Conference (ACC)*, 2011, pages 3886–3891, 2011.
29. Bajwa, R., Rajagopal, R., Varaiya, P., and Kavalier, R., "In-pavement wireless sensor network for vehicle classification," *10th International Conference on Information Processing in Sensor Networks (IPSN)* [Best paper runner up], pages 85–96, 2011.
30. Sanchez, R.O., Flores, C., Horowitz, R., Rajagopal, R., Varaiya, P., "Vehicle re-identification using wireless magnetic sensors: Algorithm revision, modifications and performance analysis," *IEEE International Conference on Vehicular Electronics and Safety (ICVES)*, pages 226-231, 2011.
31. Sanchez, R.O., Flores, C., Horowitz, R., Rajagopal, R., Varaiya, P., "Arterial travel time estimation based on vehicle re-identification using magnetic sensors: Performance analysis," *14th International IEEE Conference on Intelligent Transportation Systems (ITSC)*, pages 997-1002, 2011.
32. Krause, A., Rajagopal, R., Gupta, A., and Guestrin, C., "Simultaneous placement and scheduling of sensors," *8th International Conference on Information Processing in Sensor Networks*, pages 181– 192. IEEE Computer Society, 2009.
33. Rajagopal, R., Nguyen, X., Ergen, S. C., and Varaiya, P., "Theory of Simultaneous Fault Detection for Multiple Sensors," *2nd International Workshop on Sequential Methods (IWSM)*, pages 1-1, France, 2009.
34. Kwong, K., Kavalier, R., Rajagopal, R., and Varaiya, P., "Practical Scheme for Arterial travel time estimation based on vehicle re-identification using wireless sensors," *88th Annual Meeting of the Transportation Research Board*, Paper

- number 09-0494, pages 1-15, Washington, DC, 2009.
35. Rajagopal, R. and Varaiya, P. P., "Evaluating the health of california's loop sensor network," *88th Annual Meeting of the Transportation Research Board*, Paper number 09-1728, pages 1-15, Washington, DC, 2009.
 36. Rajagopal, R., Zhang, R., Mortazavi, H., Varaiya, A., Kowng, K., and Wunder, S., "Capturing Hybrid Vehicles in HOV Lanes," *50th Annual Forum of the TRF*, pages 1-1, Portland, 2009.
 37. Sairamesh, J., Rajagopal, R., Nemana, R., and Argenbright, K., "Early Warning and Risk Estimation methods based on Unstructured Text in Electronic Medical Records to Improve Patient Adherence and Care," *AMIA Annu Symp Proceedings 2009*, pp. 553–557, 2009.
 38. Sairamesh, J., Rajagopal, R., Khayal, I., Argenbright, K., and Nemana, R., "Early Detection Methods for Improving Patient Care: Harnessing insight from raw patient notes," *3rd INFORMS Workshop on Data Mining and Health Informatics (DMHI)*, Washington, DC, 2008.
 39. Rajagopal, R., Nguyen, X., Ergen, S. C., and Varaiya, P., "Distributed Online Simultaneous Fault Detection for Multiple Sensors," *Proceedings of the 2008 International Conference on Information Processing in Sensor Networks (IPSN 2008)*, pp. 133–144, St Louis, MO, 2008 (18.7% accepted).
 40. Rajagopal R. and Wainwright, M. J., "Stochastic Approximation Analysis of distributed algorithms," *Proceedings of the 44th Annual Allerton Conference on Communication, Control and Computation*, Monticello, IL, 2007.
 41. Rajagopal, R. and Wainwright, M., "Universal Quantile Estimation with Feedback in the Communication-Constrained Setting," *Proceedings of the 2006 IEEE International Symposium on Information Theory (ISIT)*, pp. 836–840, 2006.
 42. Ramamoorthy, S., Rajagopal, R., Ruan, Q., and Wenzel, L., Akella, In S., Amato, N., Huang, W., and Mishra, B., "Low-discrepancy curves and efficient coverage of space," *Algorithmic Foundations of Robotics VII*, Springer Verlag, 2007.
 43. Kaskiris, C., Jain, R., Rajagopal, R., and Varaiya, P., "Combinatorial Auction Design for Bandwidth Trading: An Experimental Study," *International Conference Experiments in Economic Sciences*, Okayama and Kyoto, Japan, 2004.
 44. Rajagopal, R. and Wenzel, L., "Peak Locations in All-Pass Signals—The Makhoul Conjecture Challenge," *Proceedings of the IEEE International Conference for Acoustics, Speech, and Signal Processing (ICASSP 01)*, Salt Lake City, UT, pp. 3961-3964, 2001.
 45. Rajagopal, R., Nair, D., and Wenzel, L., "Pattern Matching based on a

- Generalized Fourier Transform,” *Proceedings of the SPIE Advanced Signal Processing Algorithms, Architectures, and Implementations X*, San Diego, CA, pp. 472-480, 2000.
46. Seixas, J. M., Rajagopal, R., and Caloba, L., P., “Neural Networks applied to Particle Separation in Scintillating Calorimeters,” *IV CBRN Brazilian Congress in Neural Networks*, Sao Paulo, Brazil, 1999.
 47. Rajagopal, R., Seixas, J. M., and Caloba, L. P., “Scintillating Tile Calorimeter Time Signal Characterization,” *XIX ENFPC Brazilian Congress in Particle Physics and Field Theory*, Cachambu, Brazil, 1998.
 48. Seixas, J. M., Caloba, L. P., and Rajagopal, R., “C14] Neural Electron/Pion Discriminator with a Projective Fiber Calorimeter,” *Proceedings of the CHEP '94 Computers in High Energy Physics*, San Francisco, CA, 1999.
 49. Zahorian, S. A., Hawickhorst, B., and Rajagopal, R., “Comparison of Three Neural Network Architectures for Automatic Speech Recognition,” *Proceedings of the ANNIE '95 Artificial Neural Networks in Eng*, St. Louis, MO, 1995.

Non-refereed Publications

1. Rajagopal, R., “Large Monitoring Systems: Data Analysis, Deployment and Design,” *Ph.D. in Electrical Engineering and Computer Sciences and Designated Emphasis in Communication, Computation and Statistics*, University of California, Berkeley, 2009.
2. Rajagopal, R., “Statistical Processing in Sensor Networks: Estimation and Inference,” *M.A. in Statistics*, University of California, Berkeley, 2009.
3. Krause, A., Rajagopal, R., Gupta, A., and Guestrin, C., “Simultaneous Placement and Scheduling of Sensors,” *Technical Report CMU-ML-08-114*, 2008.
4. Rajagopal, R. and Varaiya, P., “Health of California’s Loop Detector System,” *California Path Research Report UCB-ITS-PRR*, 2007.
5. Rajagopal, R. and Varaiya, P.. Tailoring demand to match supply: how much flexibility is available in residential loads? In Virtual Control Conference. IEEE, 2013.
6. Rajagopal, R., “Efficient Sampling of Abstract Surfaces,” *MS in Electrical and Computer Eng*, University of Texas, Austin, 2002.

Patents Issued or to be Issued

1. 7,627,510, Method and apparatus matching incoming to outgoing vehicle signatures to estimate arterial vehicular movement, 04/23/2013.

2. 8,396,650, Method and apparatus generating estimates vehicular movement involving multiple input-output roadway nodes, 03/12/2013.
3. 7,627,510, System and method for conducting combinatorial exchanges, 12/01/2009.
4. 7,516,131, Method and Apparatus for Ranking-Based Information Processing, 04/07/2009.
5. 7,233,700, System and method for signal matching and characterization, 06/19/2007.
6. 7,171,048, Pattern matching system utilizing discrete curve matching with a mapping operator, 01/30/2007.
7. 7,158,677, Matching of discrete curves under affine transforms, 01/02/2007.
8. 7,139,432, Image pattern matching utilizing discrete curve matching with a mapping operator, 11/21/2006.
9. 7,136,505, Generating a curve matching mapping operator by analyzing objects of interest and background information, 11/14/2006.
10. 7,133,538, Pattern matching utilizing discrete curve matching with multiple mapping operators, 11/07/2006.
11. 7,127,100, System and method for analyzing an image, 10/24/2006.
12. 7,120,301, Efficient re-sampling of discrete curves, 10/10/2006.
13. 7,034,831, System and method for generating a low discrepancy curve in a region, 04/25/2006.
14. 7,013,047, System and method for performing edge detection in an image, 03/14/2006.
15. 6,963,667, System and method for signal matching and characterization, 11/08/2005.
16. 6,959,104, System and method for scanning a region using a low discrepancy sequence, 10/25/2005.
17. 6,950,552, System and method for precise location of a point of interest, 09/27/2005.
18. 6,917,710, System and method for scanning a region using a low discrepancy curve, 07/12/2005.
19. 6,909,801, System and method for generating a low discrepancy curve on an abstract surface, 06/21/2005.

20. 6,882,958, System and method for curve fitting using randomized techniques, 04/19/2005.
21. 6,820,032, System and method for scanning a region using conformal mapping, 11/16/2004.
22. 6,807,305, System and method for image pattern matching using a unified signal transform, 10/19/2004.
23. 6,665,335, System and method for estimating a shift between two signals where one signal is known in advance, 12/16/2003.
24. 6,615,158, System and method for analyzing a surface by mapping sample points onto the surface and sampling the surface at the mapped points, 09/02/2003.
25. 6,535,640, Signal analysis system and method for determining a closest vector from a vector collection to an input signal, 03/18/2003.
26. WO/2011/029,018 Voltage conversion and/or electrical measurements from 400 volts and upwards, 03/10/2011.

Pending Patents

1. 2013 Oriented-Wireless Structural Health and Seismic Monitoring.
2. 2013 Data-Driven Targeting of Energy Programs Including Household Energy Consumption Lifestyle Segmentation Using Hourly Data.
3. 2013 Data-Driven Targeting of Energy Programs Using Time-Series Data.
4. 0020234 Wireless and Wireline Sensor Nodes, Micro-Radar, Networks and Systems. (Submitted 2013.)
5. 0173171 In-Pavement Wireless Vibration Sensor Nodes, Networks and Systems. (Submitted 2012.)

Group Alumni (PhD and Postdocs)

Adrian Albert, Electrical Engineering, (Senior Data Scientist at C3 Energy)
Rishee Jain, Civil and Environmental Engineering (Assistant Professor, Stanford)
Amir Kavousian, Civil and Environmental Engineering (Lead Data Scientist at SunRun)
Gearoid O'Brien, Electrical Engineering (Startup)
Jungsuk Kwac, Electrical Engineering (Tapjoy)
Hae Young Noh, Civil and Env. Engineering (Assistant Professor, Carnegie Mellon)
Sean Qian, Civil and Env. Engineering (Assistant Professor, Carnegie Mellon)
Yang Yu, Civil and Env. Engineering (Assistant Professor, Tsinghua University)
Yang Weng, Electrical Engineering (Assistant Professor, Arizona State University)
Baosen Zhang, Electrical Engineering (Assistant Professor, Univ. of Washington)

Current Students

1. Junjie Qin – Institute for Computational Mechanical Engineering
Thesis: “Risk Limited Operations and Planning in Smart Grids”
Anticipated date of graduation: Summer 2017
2. Sid Patel – Civil and Environmental Engineering
Thesis: “Data-Driven Learning and Planning in Smart Grids”
Anticipated date of graduation: Summer 2018
3. Raffi Sevljan – Electrical Engineering
Thesis: “Wireless Sensor Network for Fault Management in Distribution Systems”
Anticipated date of graduation: Summer 2016
4. Gustavo Cezar – Civil and Environmental Engineering
Thesis: “Wireless Sensor and Actuator Network for Renewable Integration”
Anticipated date of graduation: Summer 2017
5. Yizheng Liao – Civil and Environmental Engineering
Thesis: “Sequential Methods for Infrastructure Health Monitoring”
Anticipated date of graduation: Summer 2017
6. Jiafan Yu – Electrical Engineering
Thesis: “Visualization and Analytics for Distributed Energy Resources”
Anticipated date of graduation: Summer 2018