Harsha Gangammanavar

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Education

Ohio State University — **Columbus, OH**
Ph.D. Integrated Systems Engineering, August 2013
Dissertation Title: Multiple Timescale Stochastic Optimization with Application to Integrating Renewable Resources in Power Systems
Advisor: Prof. Suvrajeet Sen
Minors: Computer Science and Statistics

M.S. Electrical and Computer Engineering — December 2009

Visvesvaraya Technological University — **Bangalore, India**
B.E. Electronics and Communications Engineering — May 2007

Appointments

Southern Methodist University — **Dallas, TX**
Engineering Management, Information, and Systems
Assistant Professor — August 2016 - present

Clemson University — **Clemson, SC**
Industrial Engineering
Adjunct Assistant Professor — April 2017 - present

Clemson University — **Clemson, SC**
Industrial Engineering
Postdoctoral Fellow — July 2015 - July 2016

University of Southern California — **Los Angeles, CA**
Industrial and Systems Engineering
Visiting Assistant Professor — August 2013 - May 2015

Ohio State University — **Columbus, OH**
Integrated Systems Engineering
Graduate Research and Teaching Assistant — January 2010 - July 2013

Research Interests

Methodologies: Multistage stochastic programming, large scale data-driven optimization, approximate dynamic programming.
Applications: Renewable energy integration in power systems, communication networks, health care logistics.

Journal Publications

J11. A. Alobaidi, M. Khodayar, A. Vafamehr, H. Gangammanavar, and M. Khodayar, Security Constrained Expansion Planning of Battery Energy Storage in Distribution Network with Data Centers, accepted for publication in *International Journal of Electrical Power and Energy Systems*, 2021.

J10. H. Gangammanavar and S. Sen, Stochastic Dynamic Linear Program: A Distribution-free Multistage Stochastic Programming Algorithm, accepted for publication in

SIAM Journal on Optimization, May 2021.

J9. S. Yin, J. Wang, and H. Gangammanavar, Stochastic Market Operation for Coordinated Transmission and Distribution Systems, accepted for publication in *IEEE Transactions on Sustainable Energy*, April 2021.

J8. H. Gangammanavar, Y. Liu, and S. Sen, Stochastic decomposition for two-stage stochastic linear programs with random cost coefficients, *INFORMS Journal on Computing*, 33(1):51–71, January 2021.

J7. S. Wang[§], S. J. Mason, and H. Gangammanavar, Stochastic optimization for flow-shop scheduling with on-site renewable energy generation using a case in the United States, *Computers and Industrial Engineering*, 149:106812, 2020.

J6. S. Wang[§], H. Gangammanavar, S. Ekşioğlu, and S. J. Mason, Statistical estimation of operating reserve requirements using rolling horizon stochastic optimization, *Annals of Operations Research*, 292(1): 371–397, November 2019.

J5. Z. Azadi[§], H. Gangammanavar, and S. Ekşioğlu, Developing childhood vaccine administration and inventory replenishment policies that minimize open vial wastage. *Annals of Operations Research*, 292(1): 215–247, November 2020.

J4. S. Wang[§], H. Gangammanavar, S. D. Eksioglu and S. J. Mason, Stochastic Optimization for Energy Management in Power Systems With Multiple Microgrids, in *IEEE Transactions on Smart Grid*, vol. 10, no. 1, pp. 1068-1079, Jan. 2019.

J3. H. Gangammanavar and S. Sen, Two-scale Stochastic Optimization for Controlling Distributed Storage Devices, in *IEEE Transactions on Smart Grid*, vol. 9, no. 4, pp. 2691-2702, July 2018.

J2. H. Gangammanavar, S. Sen and V. M. Zavala, Stochastic Optimization of Sub-Hourly Economic Dispatch With Wind Energy, in *IEEE Transactions on Power Systems*, 31(2), 949-959, March 2016.

J1. R. Li, H. Gangammanavar and A. Eryilmaz, Optimal Dynamic Coding and Rate-Control for Serving Deadline-Constrained Traffic over Time-Varying Channels, in *IEEE Transactions on Information Theory*, 58(10):6556-6571, 2012.

Conference Proceedings

P2. Z. Azadi[§], H. Gangammanavar and S. D. Ekşioğlu, Stochastic Optimization for Vaccine Vial Replenishment, in *Proceedings of the 2016 Industrial and Systems Engineering Research Conference (ISERC)*, Anaheim, CA.

P1. H. Gangammanavar and A. Eryilmaz, Dynamic Coding and Rate-Control for Serving Deadline-Constrained Traffic over Fading Channels, in *Proceedings of IEEE International Symposium on Information Theory (ISIT)* Austin TX, pp. 1788–1792, 13-18 June 2010.

Papers Under Review

R6. S. Ariyarathne[†], H. Gangammanavar, and R. Sundararajan, Change Point Detection in Nonstationary Sub-Hourly Wind Time Series, 2021 (under review). .

R5. D. Troxell[‡], H. Ahn, and H. Gangammanavar, A Cardinality Minimization Approach to Security-Constrained Economic Dispatch, 2021 (under review).

R4. S. Tabrizian[†], H. Gangammanavar, and H. Üster, An Adaptive Cluster Sampling-based Solution Method for Two-stage Stochastic Linear Programs, 2020 (under review).

R3. H. Gangammanavar and M. Bansal, Stochastic Hierarchical Planning for High RenewablePower Systems, 2020 (under review).

R2. N. Sakhavand[†] and H. Gangammanavar, Subproblem Sampling-based Stochastic Programming Method for Power Systems Planning and Operations Problems, 2020 (under review).

R1. S. Atakan, H. Gangammanavar and S. Sen, Stochastic Hierarchical Planning for High Renewable Power Systems, 2019 (under review).

Grants

G1. *"Data Assimilation for Radiation Therapy Planning via Optimization: Adaptive Deterministic Models"*, Role: PI (with S. Çetinkaya), SMU Lyle School Research Seed Funding, $30,500.00, March - December 2020.

G2. *"Multi-temporal Flexibility Services in Transactive Energy Architecture"*, Role: Co-PI (with M. Khodayar), SMU Lyle School Research Seed Funding, $23,760.00, March - December 2018.

G3. *"A Data-Driven Support System for Coordinated Operation of Electricity and Natural Gas Infrastructure*, Role: PI (with M. Khodayar), SMU Lyle School Research Seed Funding, $25,080.00, March - December 2017.

G4. *"Statistical Optimality, Algorithms and Resilience in Time-Staged Stochastic Systems"*, Role: Co-PI (with S. Sen (PI)), Air Force Office of Scientific Research, #FA9550-15-1-0267, $450,000, August 2015 - December 2018.

Honors

- Fellow of the Dedman College Interdisciplinary Institute 2017-18, Southern Methodist University
- Honorable mention at Minority Issues Forum poster competition (with Z. Azadi* and S. Eksioglu), INFORMS Annual Meeting, Nashville, Nov. 2016
- Postdoctoral Fellowship, Clemson University, 2015-16
- Travel grant recipient, PhD Winter School, 2011
- Travel grant recipient, llinois Wireless Summer School, 2009.

Courses taught

At Southern Methodist University*

- EMIS 3360 Operations Research (UG): Spring 2017 (26), 2018 (20), 2019 (24);
- EMIS 8360 Operations Research Models (G): Fall 2016 (26), 2017 (13), 2018 (15), 2020 (4), Spring 2020 (10), 2021 (2);
- EMIS 8371 Linear Programming (G): Fall 2018 (6), 2019 (9);
- EMIS 8384 Stochastic Programming (G): Spring 2018 (13), Spring 2020 (6);

At University of Southern California

- ISE 310 Facilities and Logistics (UG): Spring 2015;
- ISE 330 Introduction to Operations Research: Deterministic Models (UG): Spring 2015, 2014; Fall 2014, 2013;
- ISE 499 Special Topics: Integrative Systems Engineering (UG): Spring 2015, 2014;
- ISE 536 Linear Programming and Extensions (G): Fall 2014.

*Parenthetical terms indicate course enrollment size.

Ph.D. Supervision

- Sakitha Ariyarathne, PhD Student
  EMIS, Southern Methodist University.
- Niloofar Fadavi, PhD Student
  EMIS, Southern Methodist University.
- Siavash Tabrizian, PhD Candidate
  EMIS, Southern Methodist University (co-advised with Prof. Halit Uster).

Masters Supervision

- Nahal Sakhavand, MS
  EMIS, Southern Methodist University. Graduated: Summer 2018.

Professional Society Service

- *Organization Committee Member*: NSF Operations Engineering Workshop, SMU, March 2019.
- *Conference Session Chair*: INFORMS Annual Meetings 2019 (Seattle), 2018 (Phoenix), 2014 (San Francisco).
- *Referee*: *Operations Research, INFORMS Journal on Computing , INFORMS Journal on Optimization, SIAM Journal on Optimization, Computational Optimization and Applications, IISE Transactions, Optimization Letters, Energy Systems, Omega: International Journal of Management Science, IEEE Transaction on Power Systems, IEEE Transactions on Smart Grid, IEEE Transactions on Sustainable Energy, Electric Power Systems Research, IET Generation, Transmission and Distribution.*
- *Panelist*: National Science Foundation, 2017.
- *Committee Member*: George Nicholson Student Paper Competition, INFORMS 2020; INFORMS-ENRE Student Paper Competition, INFORMS, 2018.
- *Faculty Advisor*: SMU INFORMS Student Chapter, 2018-Present.
- *Vice-President*: Ohio State University INFORMS Student Chapter, 2011-2012.

Professional Society Membership

- Institute for Operations Research and Management Science (INFORMS): Optimization Society and Computing Society
- Society of Industrial and Applied Mathematics (SIAM)
- Mathematical Optimization Society (MOS).

Graduate Committee Service

- Abdulraheem Alobaidi, EE-PhD, Southern Methodist University (ongoing)
- Justin B. Brown, EMIS, Southern Methodist University (ongoing)
- Bin Huang, EE-PhD, Southern Methodist University (ongoing)
- Yanling Lin, EE, Southern Methodist University (ongoing)
- You Lin, EE-PhD, Southern Methodist University (ongoing)
- Xinyun Lu, EE-PhD, Southern Methodist University (ongoing)
- Shasha Wang, IE-PhD, Clemson University (ongoing)
- Tao Wu, EE-PhD, Southern Methodist University (ongoing)
- Mahdi Khodayar, EE-PhD, Southern Methodist University (2020)
- Mohammed A Qaudeer, EMIS (Praxis Proposal), Southern Methodist University (2020)
- Xinan Wang, EE, Southern Methodist University (2020)

- Ying Zhang, EE, Southern Methodist University (2020)
- Naderehsadat Mansouri, EMIS-PhD, Southern Methodist University (2019)
- Yang Peng, EMIS (Praxis Proposal), Southern Methodist University (2019)
- Amin Ziaeifar, EMIS-PhD, Southern Methodist University (2019)
- Site Wang, IE-PhD, Clemson University (2018).

Administrative Service

- Member and chair, Course Coordination Committee on OR Methods, 2019 – present;
- Member, Accreditation and Academic Programs, 2020 – present;
- Member, Faculty search committee, 2020, 2019.

Invited Seminars

- Industrial Engineering, University of Houston, March 2021.
- Industrial, Manufacturing, and Systems Engineering, University of Texas at Arlington, December 2018.
- Center for Applicable Mathematics, Tata Institute of Fundamental Research, Bangalore, July 2018.
- Department of Mechanical Engineering, University of Texas at Dallas, June 2018.
- Dedman College Interdisciplinary Institute (DCII), Operations Research and Statistics Cluster towards Integrative Analytics, SMU, February 2017.
- Department of Engineering Management, Information, and Systems, Southern Methodist University, February 2016.
- Industrial Engineering Technical Innovation Seminar Series, Clemson University, November 2016.
- Ming Hsieh Department of Electrical Engineering, University of Southern California, October 2014.
- Daniel J Epstein Department of Industrial and Systems Engineering, University of Southern California, October 2014.

Conference Presentations

- *A Sequential Sampling Method For Distributionally Robust Stochastic Programs*,
  - INFORMS Optimization Society Conference, Greenville, SC, March 2020.
  - International Conference on Stochastic Programming, Trondheim, July 2019.
- *Stochastic Decomposition for Two-stage Stochastic Linear Programs with Random Cost Coefficients*,
  - INFORMS Annual Meeting, Phoenix, Nov. 2018.
- *Stochastic Programming Framework for Coordinated Operation of Power Systems with Multiple Microgrids*,
  - International Symposium on Mathematical Programming, Bordeaux, July 2018.
  - INFORMS Optimization Society Conference, Denver, March 2018.
- *Sequential Sampling Based Optimization for Power Systems Application*, INFORMS Annual Meeting, Nashville, Nov. 2016.
- *Convergence Proofs of SDDP and Multi-stage Stochastic Decomposition* with S. Sen, International Conference on Stochastic Programming, Buzios, Brazil, June 2016.

- *Stochastic Dynamic Linear Programming: A Sequential Sampling Algorithm* with S. Sen,
  - INFORMS Optimization Society Conference, Greenville, SC, March 2020.
  - 21st Conference of the International Federation of Operational Research Societies, Quebec City, Canada, July 2017,
  - SIAM Conference on Optimization, Vancouver, Canada, May 2017,
  - International Conference on Stochastic Programming, Buzios, Brazil, June 2016.
- *Stochastic Optimization for Vaccine Vial Replenishment* with Z. Azadi and S. D. Eksioglu:
  - INFORMS Annual Meeting, Nashville, Nov. 2016 (Honorable mention at MIF poster competition)
  - IIE Annual Conference, Anaheim, May 2016.
- *A Rolling-Horizon Stochastic Optimization with Application in Power System* with S. Wang, S. D. Eksioglu and S. Mason, IIE Annual Conference, Anaheim, May 2016.
  - INFORMS Annual Meeting, Nashville, Nov. 2016
  - IIE Annual Conference, Anaheim, May 2016.
- *A Stochastic Optimization Framework for Distributed Decision-Making in Power Systems* with S. Wang, S. D. Eksioglu and S. Mason, IIE Annual Conference, Anaheim, 2016.
  - INFORMS Annual Meeting, Nashville, Nov. 2016
  - IIE Annual Conference, Anaheim, May 2016.
- *Multiple Timescale Stochastic Optimization for Integrating Renewable Resources* with S. Sen:
  - INFORMS Annual Meeting, San Francisco, Nov. 2014
  - Workshop on Optimization Under Uncertainty: Energy, Transportation and Natural Resources, University of California-Davis, Nov. 2014
  - Smartgrid Challenges, University of Arizona, Tucson, Mar. 2013.
- *Stochastic Optimization of Sub-hourly Economic Dispatch with Wind Generation*
  - INFORMS Annual Meeting, San Francisco, Nov. 2014
  - INFORMS Annual Meeting, Minneapolis, Oct. 2013.
- *Dynamic Coding and Rate-Control for Serving Deadline-Constrained Traffic over Fading Channels*, with A. Eryilmaz, IEEE International Symposium on Information Theory (ISIT), Austin, Jun. 2010.

Workshops Attended

- "Deep Learning", 25th Annual Teaching Effectiveness Symposium, Center for Teaching Excellence, Southern Methodist University, August 2017.
- New Faculty Colloquium, INFORMS Annual Meeting 2016, Nashville, October 2016.
- "A Conversation between Artificial Intelligence, Operations Research and Control Theory on Stochastic Optimization", NSF Workshop at Rutgers University, 2012.
- "Managing Uncertainty in Energy Infrastructure Investments", PhD Winter School, Oppdal, Norway, 2011 (recipient of workshop travel grant).

- PhD Workshop at 12th International Conference on Stochastic Programming, Halifax, NS, Canada, 2010.
- Illinois Wireless Summer School, University of Illinois, Urbana-Champaign, IL, 2010 (recipient of summer school travel grant).