Curriculum Vitae

Rajasekhar Anguluri

(mathematical engineer: statistical learning, networks, and systems theory)

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https://rajanguluri.github.io
google scholar profile:
total: 893; h-index: 15

Education

Degree	Ph.D. in Mechanical Engineering	Sept 2014 — Dec 2019
Institution	University of California, Riverside	California, USA
Degree	M.S. in Statistics	Sept 2017 — June 2019
Institution	University of California, Riverside	California, USA
Degree	Bachelor of Technology in Electrical Engineering	July 2008 — April 2013
Institution	National Institute of Technology, Warangal	Telangana, India

Academic Employment

Job Title	Assistant Professor	Jan 2024 — Present
Institution	University of Maryland, Baltimore County	Baltimore, Maryland
Job Title	Assistant Research Scientist	Jan 2023 — Dec 2024
Institution	Arizona State University	Tempe, Arizona
Job Title	Postdoctoral Scholar	Jun 2020 — Dec 2022
Institution	Arizona State University	Tempe, Arizona
Job Title	Visiting Assistant Professor	Jan 2020 — June 2020
Institution	The State University of New York at Buffalo	Buffalo, New York

Grants & Fellowships

- NSF EPCN Grant EECS-2246658. 2023-2026
  (Senior Personnel with L. Sankar (PI) and O. Kosut (co-PI))
- Mistletoe Research Fellowship 2022-2023
  (Funded by the Momental Foundation)

Honors & Awards

- Mistletoe Research Fellowship award by The Momental Foundation, Redwood, CA, USA. 2022.
- *Travel Award*: Asia Signal Processing Society-Annual Summit Conf., Honolulu, HI, USA. 2018.
- *Travel Award*: Random Matrices and Free Probability Workshop, UCLA, CA, USA. 2018
- *Travel Award*: IEEE American Control Conference, Boston, MA, USA. 2016
- *Travel Award*: IEEE Conference on Decision and Control, Las Vegas, NV, USA. 2016
- *Graduate Studies Fellowship*: Dean's Distinguished Fellowship, UC Riverside, CA, USA. 2014
- *Best Student Paper Finalist*: Systems Man and Cybern., Anchorage, AK, USA. 2011
- *Gold Medals* for research excellence as an undergraduate student, NIT Warangal, India. 2010-12
- *Best (second) Paper* at M.V. Chauhan Student Paper Contest, IEEE India Council. 2010.

Publications

Submitted for publication

[1] R. Anguluri, "Diagonal Dominance of Laplacian Pseudoinverse: A Short Proof," *Linear Algebra and Applications*, Elsevier 2024.

[2] A. Zhahin, R. Anguluri, and G. Dasarathy, "Robust Model Selection of Non Tree-Structured Gaussian Graphical Models," *Journal of Machine Learning Research*, 2023. Preprint arXiv:2211.05690.

[3] J. Mathias, R. Anguluri, O. Kosut and L. Sankar, "Model Predictive Control for Joint Regulation and Dispatch of Distributed Energy Resources," *IEEE Power and Energy Society General Meeting*, 2024.

[4] R. Anguluri and A. Pal, "Localizing Single and Multiple Oscillatory Sources: A Frequency Divider Approach," *IEEE Power and Energy Society General Meeting*, 2024.

[5] R. Anguluri, O. Kosut and L. Sankar, "Identifying Edge Changes in Networks from Input and Output Covariance Data," *IEEE Control Systems Letters*, 2024.

[6] A. C. Varghese, R. Anguluri, L. Sankar, and A. Pal, "Simultaneous instrument transformers calibration and line parameter estimation via constrained non-linear least squares," *IEEE Trans. on Power Delivery*, 2023.

[7] A. Rayas, J. Cheng, R. Anguluri, and G. Dasarathy, "Learning Networked Systems that Obey Conservation Laws from Stationary Processes,"*Neural Information Processing Systems (NeurIPS)*, 2023.

[8] N. Ghoroghchian, R. Anguluri, G. Dasarathy, and S. Draper, "Controllability of coarsely characterized linear network dynamics," *International Journal of Adaptive Control and Signal Processing*, 2023. Preprint arXiv:2206.10569.

Journal publications

[1] R. Anguluri, L. Sankar, and O. Kosut, "Localization and estimation of forced inputs: A group LASSO approach,"*IEEE Transactions on Control of Network Systems*, vol. 10, no. 4, pp. 1997-2009, Dec. 2023.

[2] R. Anguluri, G. Dasarathy, O. Kosut and L. Sankar, "Grid topology identification with hidden nodes via structured norm minimization,"*IEEE Control Systems Letters*, vol. 6, pp. 1244-1249, 2022.

[3] R. Anguluri, V. Katewa, S. Roy, and F. Pasqualetti, "Network theoretic analysis of maximum a posteriori detectors for optimal input detection,"*Automatica*, Elsevier, vol. 141, pp. 110227, 2022.

[4] V. Katewa, R. Anguluri, and F. Pasqualetti, "On a security vs privacy trade-off in interconnected dynamical systems,"*Automatica*, Elsevier, vol. 125, pp. 109426, 2021.

[5] R. Anguluri, V. Katewa, and F. Pasqualetti, "Centralized vs decentralized detection of attacks in stochastic interconnected systems,"*IEEE Transactions on Automatic Control*, vol. 65, no. 9, pp. 3903-3910, 2020.

[6] B. Zheng, P. Deng, R. Anguluri, Q. Zhu, and F. Pasqualetti, "Cross-layer codesign for secure CPS,"*IEEE Transactions on Computer Aided Design of Integrated Circuits and Systems*, vol. 5, pp. 699-711, 2016.

[7] R. Anguluri, N. Lynn, S. Das and PN. Suganthan, "Computing with the collective intelligence of honey bees – a survey,"*Swarm and Evolutionary Computation*, Elsevier, vol. 32, pp. 25-48, 2017.

[8] R. Anguluri, R.K. Jatoth and A. Abraham, "Design of intelligent PID/PI$^{\lambda}$D$^{\mu}$ speed controller for chopper fed DC motor drive using ABC algorithm,"*Engg. Applications of A.I.*, Elsevier, vol. 29, pp. 13-32, 2014.

[9] R. Anguluri, A. Abraham and M. Pant, "A hybrid differential artificial bee colony algorithm based tuning of fractional order controller for permanent magnet synchronous motor drive,"*International Journal of Machine Learning and Cybernetics*, Springer, vol. 5, pp. 327-337, 2014.

CS-style conference publications

[1] A. Rayas, R. Anguluri, and G. Dasarathy, "Learning the structure of large networked systems obeying conservation,"*Neural Information Processing Systems (NeurIPS)*, vol. 35, pp. 14637–14650, 2022.

Conference publications

[1] R. Anguluri, M. Malu, J. Cheng, and G. Dasarathy, "Learning Toeplitz Networks that obey Conservation Laws," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, COEX, Seoul, Korea, 2024 (**submitted**).

[2] R. Anguluri, N. Taghipourbazargani, O. Kosut and L. Sankar, "Source Localization in Linear Dynamical Systems using Subspace Model Identification," *7th IEEE Conference on Control Technology and Applications (CCTA)*, Bridgetown, Barbados 2023, pp. 1016-1021.

[3] A. Rayas, R. Anguluri, J. Cheng, and G. Dasarathy, "Differential analysis for networks obeying conservation Laws," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Rhode Island, Greece, 2023, pp. 1-5.

[4] R. Anguluri, L. Sankar, and O. Kosut, "Parameter estimation in ill-conditioned low-inertia power systems," *IEEE North American Power Symposium (NAPS)*, Salt Lake City, 2022, pp. 1-6.

[5] R. Anguluri, N. Taghipourbazargani, O. Kosut and L. Sankar, "A complex-LASSO for localizing forced oscillations in power systems," *IEEE Power & Energy Society General Meeting*, Denver, 2022, pp. 1-05.

[6] R. Anguluri and F. Pasqualetti, "Deflection-based Attack Detection for Network Systems,"*IEEE American Control Conference*, New Orleans, 2021, pp. 3254-3259. (**invited paper**).

[7] R. Anguluri, A. A. A. Makdah, V. Katewa and F. Pasqualetti, "On the robustness of data-driven controllers for linear systems,"*Learning for Dynamics and Control (L4DC)*, PMLR 120:404-412, 2020.

[8] R. Anguluri, V. Katewa, and F. Pasqualetti, "A probabilistic approach to design switching attacks against interconnected systems,"*IEEE American Control Conference (ACC)*, Philadelphia, 2019, pp. 4430-4435.

[9] R. Anguluri, V. Katewa, and F. Pasqualetti, "Attack detection in interconnected systems: centralized vs decentralized detectors,"*IEEE Conference on Decision and Control (CDC)*, Miami, 2018, pp. 4541-4546.

[10] R. Anguluri, V. Katewa, and F. Pasqualetti, "On the role of information sharing in the security of interconnected systems,"*IEEE Asia Pacific Signal and Information Processing Association (APSIPA)*, Honolulu, 2018, pp. 1168-1173.

[11] V. Katewa, R. Anguluri, A. Ganlath, and F. Pasqualetti, "Secure reference-tracking with resource-constrained UAV," *IEEE Conference on Control Technology and Applications*, HI, 2017, pp. 1319-1325.

[12] R. Anguluri, R. Dhal, S.Roy, and F. Pasqualetti, "Network invariants for optimal input detection,"*IEEE American Control Conference (ACC)*, Boston, MA, 2016, pp. 3776-3781.

[13] R. Anguluri, V. Gupta, and F. Pasqualetti, "Periodic coordinated attacks against cyber-physical systems: detectability and performance bounds,"*Conference on Decision and Control* , NV, 2016, pp. 5079-5084.

[14] R. Anguluri, M. Pant, and A. Abraham, "Differential search algorithm based design of fractional order PID controller for hard disk drive read/write system,"*IEEE Conference on Systems, Man, and Cybernetics (SMC)*, Machester, UK, 2013, pp. 2019-2025.

[15] B.S. Theja, R. Anguluri, and A. Abraham, "An optimal design of coordinate PI based PSS with TCSC controller using modified teaching learning based optimization," *World Congress on Nature and biologically Inspired Computing*, Fargo, 2013, pp. 99-106.

[16] B.S. Theja, R. Anguluri, and D.P. Kothari, "An intelligent coordinate design of UPFC based power system stabilizer for dynamic stability enhancement of SMIB power system,"*IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)*, Bengaluru, India, 2012, pp. 1-6.

[17] R. Anguluri, R. Rani, K. Ramya, and A. Abraham, "Elitist teaching learning opposition based algorithm for global optimization,"*IEEE Conference on Systems, Man, and Cyber.*, Seoul, Korea, 2012, pp. 1124-1129.

[18] R. Anguluri, A. Abraham and M. Pant, "Levy mutated ABC algorithm for global optimization,"*IEEE Conference on Systems Man and Cybernetics (SMC)*, Anchorage, 2011, pp. 655-662. (**BEST STUDENT PAPER FINALIST**).

Teaching Experience

Instructor

- CMSC 691– Matrix Methods and Convex Optimization — UMBC, Spring 2024
- MTH 512 – Introduction to Statistical Inference — Univ. at Buffalo, Spring 2020

Teaching Assistant at UC Riverside

- STAT 100A – Introduction to Statistics — Spring 2024
- ME 120 – Introduction to Linear Systems — Spring 2020
- ME 133 – Mechatronics Lab — Winter 2018, 2019
- ME 233 – Secure and Reliable Control Systems — Spring 2016

Student Mentoring as a Postdoc at ASU

Theory

- Jiajun Cheng (undergrad, ASU); Project: *differential analysis for networks obeying conservation laws.* 2022
- Anirudh Rayas (grad, ASU); Project: *structure learning in networks obeying conservation laws.* 2022
- Vineet Sunil Gattani (grad, ASU); Project: *on non-stochastic sparse control problems.* 2022
- Abrar Zahin (grad, ASU); Project: *Structure learning in robust graphical models.* 2021
- Nafiseh Ghoroghchian (grad, UToronto); project: *coarse controllability in brain networks.* 2021

Machine learning applications:

- Obai Bahwal (grad, ASU); Project: *machine-learning detectors for mimicking attacks in power system.* 2022
- Nima T. Bazargani (grad, ASU); Project: *machine learning for event identification in power systems.* 2022

Academic Service

organization:

- 2024. Program committee member of Reliability and Dependability of AI, International Conference on Machine Learning (ICML)
- 2022. Session chair, North American Power Systems Symposium (NAPS), UT, USA
- 2020. Logistics Chair, Third Northeast Regional Conf. on Complex Systems, NY, USA
- 2016. Volunteer, IEEE Conference on Decision and Control, Las Vegas, NV, USA

- 2011. Volunteer, IEEE Conference on Systems, Man and Cybernetics, Anchorage, AK, USA

Outreach:

- 2017. Taught high-school math to Nivedita Kanrar, K12-student, Riverside STEM Academy, USA. (B.S. at Caltech and Ph.D. at Princeton)

Peer review service

Journals:

- IEEE Transactions on Automatic Control
- IEEE Transactions on Control of Network Systems
- IEEE Transactions on Signal and Information Processing over Networks
- IEEE Transactions on Power Systems
- IEEE Transactions on Network Science and Engineering
- IEEE Control Systems Letters
- IEEE Signal Processing Letters
- IEEE Open Journal of Control Systems
- Elsevier (Automatica, Information Sciences, and Systems & Control Letters)

non-ML/AI Conferences:

- IEEE Conference on Decision and Control
- American Control Conference
- Indian Control Conference
- IEEE Modeling, Estimation, and Control Conference
- IFAC Symposium on Large Scale Complex Systems
- IEEE Power Systems General Meeting
- IEEE/RSJ International Conference on Intelligent Robots and Systems

ML/AI Conferences:

- Neural Information Processing Systems (NeuRIPS)
- Artificial Intelligence and Statistics (AISTATS)
- AAAI Conference on Artificial Intelligence (AAAI)

Selected talks

- Systems and Control Program, Indian Institute of Technology, Bombay (September 2023)
- Department of Electrical Engineering, Indian Institute of Technology, Kanpur (September 2023)
- IEEE Conference on Control Technology and Applications, Bridgetown, Barbados (August 2023)
- Center for Machine Intelligence and Data Science, Indian Institute of Technology, Bombay (May 2023)
- Department of Electrical Engineering, Indian Institute of Technology, Gandhinagar (April 2023)
- Computer Science and Electrical Engineering, University of Maryland, Baltimore County (April 2023)
- IEEE North American Power Symposium, Salt Lake, UT, USA (October 2022)
- IEEE PES General Meeting, Denver, CO, USA (July 2022)
- IEEE Control Control Conference, Austin, TX, USA (Dec 2021)
- IEEE American Control Conference, Philadelphia, PA, USA (May 2021)
- LIONS Seminar, Arizona State University, Tempe, USA (Apr 2021)
- Applied Mathematics Seminar, UB-SUNY, NY, USA (Feb 2020)
- IEEE American Control Conference, Philadelphia, PA, USA (July 2019)
- IEEE Conference on Decision and Control, Miami, FL, USA (December 2018)
- APSIPA Annual Summit Conference, Honolulu, HI, USA (November 2018)
- 35th Southern California Workshop, University of California, Riverside, USA (May 2018)
- IEEE Conference on Decision and Control, Las Vegas, NV, USA (Dec 2016)

Conferences, Workshops, and Summer Schools Participation

- NSF-Sponsored Joint US-Europen Workshop 2022, Online (May 2022)
- Grid Science Winter School and Conference, Los Alamos National Laboratory, USA (January 2023)
- Advanced Training: PSERC Transformative Summer School, Arizona, USA (July 2022)
- 35th Southern California Control Workshop, UC Riverside, USA (May 2018)
- Random Matrices: Theory and Applications, UC Riverside, USA (Nov 2017)
- 29th Southern California Control Workshop, Caltech, USA (April 2017)
- 27th Southern California Control Workshop, University of Southern California, USA (May 2016)

Professional Affiliations

- IEEE (including control systems society and power engineering society) 2015 - present
- American Mathematical Society (AMS) 2023-present
- International Linear Algebra Society (ILAS) 2023 - present