

Dileep Kalathil

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Research Interests Theory: Statistical Learning, Control Theory, Game Theory and Mechanism Design
Applications: Intelligent Transportation Systems, Renewable Energy Systems,
Cyber Physical Systems, Communication Networks

Education

University of California, Berkeley Oct. 2014 - Aug. 2017
Postdoctoral Researcher
Electrical Engineering and Computer Sciences
Mentors: Prof. Pravin Varaiya and Prof. Kameshwar Poolla

University of Southern California Aug. 2009 - Sep. 2014
PhD in Electrical Engineering
Advisor: Prof. Rahul Jain
Thesis : Empirical Methods in Control and Optimization

Indian Institute of Technology, Madras Aug. 2006 - May 2008
M.Tech. in Electrical Engineering
Advisors: Prof. Andrew Thangaraj and Prof. Srikrishna Bhashyam
Thesis : LDPC Codes over OFDM System

National Institute of Technology, Calicut Aug. 2002 - May 2006
B.Tech. in Electronics and Communication Engineering

Honors and Achievements

- Best PhD Dissertation, Department of Electrical Engineering, USC, 2014-15
- Finalist (one of the three) for the Best PhD Dissertation in the Viterbi School of Engineering (out of eight departments), USC, 2014-15
- Best Teaching Assistant Award (honorable mention), Department of Electrical Engineering, USC, 2011-2012
- Annenberg Graduate Fellowship (2009-2011)
- Best Academic Performance Award, M.Tech. Batch, Department of Electrical Engineering, IIT Madras, 2008.

Other Research Projects

Data-analytics and Online Learning for Demand Response Oct. 2014 - present
Mentor: Prof. Ram Rajagopal
Dept. of Civil and Environmental Engineering, Stanford University

Concentration Inequalities for a Class of Ising Models Aug. 2013 - Dec. 2013
Mentor: Prof. Larry Goldstein
Dept. of Mathematics, USC

Reinforcement Learning in MDPs and Stochastic Games May 2013 - Aug. 2013
Mentor: Prof. Vivek Borkar
Dept. of Electrical Engineering, IIT, Mumbai

Work Experience	Research Engineer	July 2008 - July 2009
	Center of Excellence in Wireless Technology (CEWiT), Chennai, India	
	Graduate Research Assistant	Aug. 2009 - Sept. 2014
	University of Southern California	

Publications

Journals: Published/Accepted

- J1.** Dileep Kalathil, Rahul Jain, "Spectrum Sharing through Contracts for Cognitive Radios", *IEEE Transactions on Mobile Computing*, 12(10):1999-2011, October, 2013. (Download PDF)
- J2.** Dileep Kalathil, Naumaan Nayyar, Rahul Jain, "Decentralized Learning for Multi-Player Multi-Armed Bandits", *IEEE Transactions on Information Theory*, 60(4):2331-2345, April, 2014. (Download PDF)
- J3.** (Authors are in the alphabetical order) William Haskel, Rahul Jain, Dileep Kalathil, "Empirical Dynamic Programming", *Mathematics of Operations Research*, 41(2):402 - 429, January, 2016. (Download PDF)
- J4.** Dileep Kalathil, Vivek Borkar, Rahul Jain, "Approachability in Stackelberg Stochastic Games with Vector Costs", *Dynamic Games and Applications*, 7(3):422-42, September, 2017. (Download PDF)
- J5.** Naumaan Nayyar, Dileep Kalathil, Rahul Jain, "On Regret-Optimal Learning in Decentralized Multi-player Multi-armed Bandits", *IEEE Transactions on Control of Network Systems*, December, 2016. (Download PDF)
- J6.** Naumaan Nayyar, Dileep Kalathil, Rahul Jain, "Optimal Decentralized Control with Asymmetric One-Step Delayed Information Sharing", *IEEE Transactions on Control of Network Systems*, December, 2016. (Download PDF)
- J7.** Dileep Kalathil, Chenye Wu, Kameshwar Poolla, Pravin Varaiya, "Sharing Economy for the Smart Grid", accepted to *IEEE Transactions on Smart Grids*, August, 2017. (Download PDF)

Journals Preprint:

- J8.** Deepan Muthirayan, Dileep Kalathil, Kameshwar Poolla, Pravin Varaiya, "Mechanism Design for Self-Reporting Baselines in Demand Response", for submission to *IEEE Transactions on Smart Grids*, August, 2017. (Download PDF)
- J9.** Dileep Kalathil, Vivek Borkar, Rahul Jain, "Empirical Q-Value Iteration", submitted to *Stochastic Systems*, September, 2015. (Download PDF)
- J10.** Jonathan Mather, Enrique Baeyens, Dileep Kalathil, Kameshwar Poolla, "The Geometry of Locational Marginal Prices", for submission to *IEEE Transactions on Power Systems*, August, 2017. (Download PDF)
- J11.** Dileep Kalathil, Ram Rajagopal, "Learning Demand Response with Bandits", for submission to *IEEE Transactions on Power Systems*, August, 2017. (Download PDF)
- J12.** Dileep Kalathil, Deepan Muthirayan, Dai Wang, Kameshwar Poolla, Pravin Varaiya, "Selling Demand Response Using Options", to be submitted to *IEEE Transactions on Smart Grid*, October, 2016. (Download PDF)

Conference Proceedings:

- C15.** Deepan Muthirayan, Dileep Kalathil, Kameshwar Poolla, Pravin Varaiya, "Mechanism Design for Self-Reporting Baselines in Demand Response", *American Control Conference (ACC)*, July, 2016.
- C14.** Dileep Kalathil, Ram Rajagopal, "Online Learning for Demand Response", *Allerton Conference on Communications, Control and Computing*, October, 2015.

- C13.** Dileep Kalathil, Vivek Borkar, Rahul Jain, "Blackwell's Approachability in Stackelberg Stochastic Games: A Learning Version", *IEEE Conference on Decision and Control (CDC)*, December, 2014.
- C12.** (Authors are in the alphabetical order) William Haskel, Rahul Jain, Dileep Kalathil, "Empirical Policy Iteration for Approximate Dynamic Programming". *IEEE Conference on Decision and Control (CDC)*, December, 2014.
- C11.** Naumaan Nayyar, Dileep Kalathil, Rahul Jain, "Optimal Decentralized Control in Unidirectional One-Step Delayed Sharing Pattern with Partial Output Feedback", *American Control Conference*, June, 2014.
- C10.** (Authors are in the alphabetical order) William Haskel, Rahul Jain, Dileep Kalathil, "Empirical Value Iteration for Approximate Dynamic Programming". *American Control Conference*, June, 2014.
- C9.** Naumaan Nayyar, Dileep Kalathil, Rahul Jain, "Optimal Decentralized Control in Unidirectional One-Step Delayed Sharing Pattern", *Allerton Conference on Communications, Control and Computing*, October, 2013.
- C8.** Dileep Kalathil, Naumaan Nayyar, Rahul Jain, "Decentralized Learning for Multi-Player Multi-Armed Bandits", *IEEE Conference on Decision and Control (CDC)*, Hawaii, December, 2012.
- C7.** Dileep Kalathil, Rahul Jain, "Investigation for Cooperative Relaying in a Simple Information-Theoretic Model", *IEEE International Symposium on Information Theory (ISIT)*, Boston, July, 2012.
- C6.** Dileep Kalathil, Rahul Jain, "Communication Games on the Generalized Gaussian Relay Channel", *Allerton Conference on Communications, Control and Computing*, October, 2010.
- C5.** Dileep Kalathil, Rahul Jain, "Spectrum Sharing Through Contracts", *IEEE Symposium on Dynamic Spectrum Access Networks (DySPAN)*, Singapore, April, 2010.
- C4.** Dileep Kalathil, Rahul Jain, "A Contract Based Approach to Spectrum Sharing in Cognitive Networks", *IEEE WiOpt Conference*, Avignon, France, June, 2010.
- C3.** K.Kuchi, Vinod R., Dileep Kalathil, M.S.Padmanabhan, Dhivagar R., "Interference Mitigation Using Conjugate Data Repetition" *IEEE International Conference on Communication (ICC)*, 2009.
- C2.** Dileep Kalathil, A.Iyengar, A.Thangaraj, S.Bhashyam, "Low Density Parity Check Codes in OFDM Systems", *National Conference on Communication (NCC)*, 2009.
- C1.** A.Iyengar, Dileep Kalathil, A.Thangaraj, S.Bhashyam, "Thresholds for LDPC codes over OFDM", *Proceedings of the IEEE International Conference on Communication Systems Software and Middleware and Workshops (COMSWARE)*, 2008.

Patents

1. US9030992 B2: Pilot aided data transmission and reception with interference mitigation in wireless systems
2. US8699446 B2: Precoding for multiple transmission streams in multiple antenna systems

Teaching Experience

- Teaching Assistant, *Stochastic Processes (EE 512)*,
Taught by Prof. Rahul Jain Aug. 2011 - Dec. 2011, USC
- Teaching Assistant, *Networks and Systems*
Taught by Prof. Bhaskar Ramamurthy Jan. 2007 - May 2007, IIT-Madras
- Teaching Assistant, *Computer Aided Design in Electrical Engineering*
Taught by Prof. Andrew Thangaraj Aug. 2007 - Dec. 2007, IIT-Madras
- Teaching Assistant, *Computer Aided Design in Electrical Engineering*
Taught by Prof. Harishankar Ramachandran Jan. 2008 - May 2008, IIT-Madras

Student Mentoring

- Deepan Muthirayan, PhD student, UC Berkeley
Now a postdoc in Cornell University Jan. 2015 - Dec. 2016
- Jonathan Mather, PhD student, UC Berkeley Jan. 2015 - Dec. 2016
- Dai Wang, Visiting PhD student
Xi'an Jiaotong University, China Oct. 2014 - Sept. 2015
Now a postdoc in Lawrence Berkeley National Lab

Selected Invited Talks

- Sequential Learning, Optimization and Control for Cyber-Physical Systems
 - EECS, University of Michigan, March, 2016
 - IEOR, Columbia University, March, 2016
 - ISE, Arizona State University, March, 2016
 - ECE, Texas A&M University, March, 2016
 - ISyE, University of Wisconsin, February, 2016
- Modeling, Managing and Monetizing Demand Flexibility in the Next Generation Grid
 - EECS, MIT, March, 2016
 - Electrical and Computer Engineering, Carnegie Mellon University, March, 2016
 - Management Science & Engineering, Stanford University, February, 2016
 - VEG seminar, EECS, UC Berkeley, February, 2016
 - Industrial and Enterprise Systems Engineering, UIUC, February, 2016
 - S2L2 seminar, USC, February, 2016
 - Electrical and Computer Engineering, UCSD, February, 2016
 - Industrial and Operations Engineering, University of Michigan, January, 2016
- Empirical Dynamic Programming
 - Hybrid Systems Seminar, EECS, UC Berkeley, July, 2015
 - S3L Seminar, Stanford University, April, 2015
- The Art of Gambling in a Team: Multi-player Multi-Armed Bandits
 - Electrical Engineering, UCLA, June, 2014
 - EECS, UC Berkeley, July, 2014

Software and Programming

TensorFlow for deep learning, R for statistical computing, C++, Matlab

Relevant Course Work

Measure Theory (MATH)	Functional Analysis (MATH)
Probability Theory (MATH)	Optimization (MATH)
Topics in Statistical Inference (MATH)	Stochastic Differential Equations (MATH)
Applied Probability (MATH)	Concentration Inequalities (MATH)
Stochastic Control (EE)	Linear Systems Theory (EE)
Optimal Control (EE)	Estimation Theory (EE)
Stochastic Network Optimization (EE)	Feedback Control (EE)
Network Economics & Game Theory (EE)	Wireless Communication (EE)

Referee Services

Reviewer for IEEE Transactions on Automatic Control, IEEE Transactions on Control of Network Systems, IEEE Transactions on Smart Grids, IEEE Transactions on Power Systems, IEEE Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Journal on Selected Areas in Communications, Conference on Conference on Decision and Control (CDC), American Control Conference (ACC), International Symposium on Information Theory (ISIT).

References

1. Prof. Pravin Varaiya
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2. Prof. Kameshwar Poolla
Dept. of Electrical Engineering and Computer Sciences &
Dept. of Mechanical Engineering
University of California, Berkeley
5141, Etcheverry Hall, Berkeley, CA 94720-1742
Ph: 510-520-1150, Email: poolla@berkeley.edu
3. Prof. Rahul Jain
Dept. of Electrical Engineering &
Dept. of Industrial and Systems Engineering (By courtesy)
University of Southern California (USC)
EEB-328, Los Angeles, CA 90089, USA.
Ph: 213-740-2246, Email: rahul.jain@usc.edu
4. Prof. Ram Rajagopal
Dept. of Civil and Environmental Engineering
Stanford University
Y2E2-290, Stanford, CA 94305, USA.
Ph: 650-725-4268, Email: ramr@stanford.edu
5. Prof. Vivek S. Borkar
Dept. of Electrical Engineering
Indian Institute of Technology, Bombay
Mumbai 400076, India.
Ph: (91)-22-25769405, Email: borkar.vs@gmail.com
6. Prof. Larry Goldstein
Dept. of Mathematics
University of Southern California (USC)
Kaprielian Hall, Room 108, Los Angeles, CA 90089, USA.
Ph: 213-740-2405, Email: larry@usc.edu