

Dionysios S. Kalogierias

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Research Interests

Machine and Reinforcement Learning, Optimization, Artificial Intelligence, Sequential Decisions, Risk Autonomous and Distributed Systems, Network Control, Wireless Communications, Security and Privacy

Appointments

University of Pennsylvania <i>Postdoctoral Researcher, Department of Electrical & Systems Engineering</i> <i>Hosts: Prof. George J. Pappas and Prof. Alejandro Ribeiro</i>	Philadelphia, PA <i>June 2019 - Present</i>
Princeton University <i>Postdoctoral Research Associate, Department of Operations Research & Financial Engineering</i> <i>Host: Prof. Warren B. Powell</i>	Princeton, NJ <i>June 2017 - May 2019</i>
Rutgers, The State University of New Jersey <i>PhD Research Assistant, CSPL, Department of Electrical & Computer Engineering (ECE)</i>	Piscataway, NJ <i>Sep 2012 - May 2017</i>
University of Patras <i>MS Research Assistant, SPCL, Department of Computer Engineering & Informatics</i>	Patras, Greece <i>Sep 2010 - Aug 2012</i>

Education

Rutgers, The State University of New Jersey <i>PhD in Electrical & Computer Engineering (GPA: 4/4 Double Distinction)</i> <i>Advisor: Prof. Athina Petropulu</i>	Piscataway, NJ <i>May 2017</i>
University of Patras <i>MS in Signal Processing & Communications, Graduate Program "SPCOMS" (GPA: 9.6/10)</i> <i>Advisor: Prof. Emmanouil Z. Psarakis</i>	Patras, Greece <i>Sep 2012</i>
University of Patras <i>Diploma (BS & MEng) in Computer Engineering & Informatics (GPA: 7.92/10)</i> <i>Advisor: Prof. Emmanouil Z. Psarakis</i>	Patras, Greece <i>Sep 2010</i>

Honors & Awards

Rutgers School of Engineering (SOE) Outstanding Graduate Student Award (\$ 500) - PhD Distinction	2017
Rutgers ECE Graduate Program Academic Achievement Award - PhD Distinction	2017
Nominee for ICASSP Best Student Paper Award (16 nominees in total)	2016
ICASSP Best Student Paper of the Special Sessions	2016
ICASSP NSF Travel Grant Award (\$ 500)	2016
Graduate School-New Brunswick Conference Travel Award (\$ 300)	2016
Rutgers SOE TA/GA Professional Development Fund Award (\$ 2,100)	2015
Rutgers ECE Student Development Award	2015
Gerondelis Foundation Fellowship, Gerondelis Foundation, Inc. (\$ 5,000)	2014 - 2015
ICASSP NSF Travel Grant Award (\$ 1,100)	2014
SPAWC Travel Grant Award (\$ 1,500)	2013
Rutgers ECE PhD Student Research Excellence Award	2013
Rutgers Leeds Fellowship (\$ 20,000)	2012 - 2013
Rutgers ECE Graduate & Teaching Assistantship	2012 - 2017

Papers under Review or Preparation

- [T6] **D. S. Kalogerias** and W. B. Powell, “Zeroth-order Algorithms for Risk-Aware Learning,” submitted in 2019 (under review).
- [T5] K. E. Nikolakakis, **D. S. Kalogerias**, and A. D. Sarwate, “Non-Parametric Structure Learning on Hidden Tree-Shaped Distributions,” submitted in 2019 (under review).
- [T4] A. Dimas, **D. S. Kalogerias**, and A. P. Petropulu, “Spatially-Aware mmWave Communications in the City,” under preparation in 2019.
- [T3] A. Dimas, **D. S. Kalogerias**, and A. P. Petropulu, “Joint Beamforming and Dynamic Relay Positioning for mmWave Urban Communications,” to be submitted in 2019.
- [T2] **D. S. Kalogerias** and W. B. Powell, “Gradient-Based Recursive Risk-Averse Optimization,” Mathematical Programming Series A, submitted in 2018 (under review). Extended preprint available on *Arxiv*.
- [T1] K. E. Nikolakakis, **D. S. Kalogerias**, and A. D. Sarwate, “Predictive Learning on Hidden Tree-Structured Ising Models,” Journal of Machine Learning Research (JMLR), submitted in 2019 (under review). Available on *Arxiv*.

Journal Publications

- [J5] **D. S. Kalogerias** and A. P. Petropulu, “Spatially Controlled Relay Beamforming,” IEEE Transactions on Signal Processing, vol. 66, no. 24, pp. 6418 - 6433, December 2018.
- [J4] **D. S. Kalogerias** and A. P. Petropulu, “Uniform ε -Stability of Distributed Nonlinear Filtering over DNAs: Gaussian-Finite HMMs,” IEEE Transactions on Signal & Information Processing over Networks (Special Issue on Inference & Learning over Networks), vol. 2, no. 4, pp. 461 - 476, December 2016.
- [J3] **D. S. Kalogerias** and A. P. Petropulu, “Grid-Based Filtering of Markov Processes Revisited: Recursive Estimation & Asymptotic Optimality,” IEEE Transactions on Signal Processing, vol. 64, no. 16, pp. 4244 - 4259, July 2016.
- [J2] **D. S. Kalogerias** and A. P. Petropulu, “Asymptotically Optimal Discrete Time Nonlinear Filters From Stochastically Convergent State Process Approximations,” IEEE Transactions on Signal Processing, vol. 63, no. 13, pp. 3522 - 3536, July 2015.
- [J1] **D. S. Kalogerias** and A. P. Petropulu, “Matrix Completion in Colocated MIMO Radar: Recoverability, Bounds & Theoretical Guarantees,” IEEE Transactions on Signal Processing, vol. 62, no. 2, pp. 309 - 321, January 2014.

Conference Publications (peer-reviewed)

- [C13] K. E. Nikolakakis, **D. S. Kalogerias**, and A. D. Sarwate, “Learning Tree Structures from Noisy Data,” 22nd International Conference on Artificial Intelligence and Statistics (AISTATS 2019), Naha, Okinawa, Japan, April 2019.
- [C12] A. Dimas, **D. S. Kalogerias**, C. Koumpouzi, and A. P. Petropulu, “Parameter Estimation for Hierarchical Channel Profiling,” 5th IEEE Global Conference on Signal and Information Processing (GlobalSIP 2017), Montreal, Canada, November 2017.
- [C11] **D. S. Kalogerias** and A. P. Petropulu, “Enhancing QoS in Spatially Controlled Beamforming Networks via Distributed Stochastic Programming,” 42nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2017), New Orleans, LA, USA, March 2017.
- [C10] **D. S. Kalogerias** and A. P. Petropulu, “Mobile Beamforming & Spatially Controlled Relay Communications,” 41st IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2016), Shanghai, China, March 2016 (“**Best Paper of the Special Sessions**”).
- [C9] **D. S. Kalogerias** and A. P. Petropulu, “Distributed Nonlinear Filtering of Partially Observed Markov Chains over WSNs: Truncating the ADMM,” 49th Asilomar Conference on Signals, Systems & Computers (Asilomar 2015), Asilomar Hotel & Conference Grounds, Pacific Grove, CA, USA, November 2015.

- [C8] **D. S. Kalogerias** and A. P. Petropulu, "On Pathwise Convergence of Particle & Grid Based Nonlinear Filters: Feller vs Conditional Regularity," 53rd Annual Allerton Conference on Communication, Control, and Computing (Allerton 2015), Monticello, Illinois, September 29 - October 2, 2015.
- [C7] **D. S. Kalogerias** and A. P. Petropulu, "Nonlinear SpatioTemporal Channel Gain Map Tracking in Mobile Cooperative Networks," 16th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC 2015), Stockholm, Sweden, June/July 2015.
- [C6] **D. S. Kalogerias** and A. P. Petropulu, "Mobi-Cliques for Improving Ergodic Secrecy in Fading Wiretap Channels under Power Constraints," 39th IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2014), Florence, Italy, May 2014.
- [C5] **D. S. Kalogerias** and A. P. Petropulu, "RIP Bounds for Naively Subsampled Scrambled Fourier Sensing Matrices," 48th Annual Conference on Information Sciences & Systems (CISS 2014), Princeton, NJ, USA, March 2014.
- [C4] **D. S. Kalogerias** and A. P. Petropulu, "MC-MIMO Radar: Recoverability and Performance Bounds," 1st IEEE Global Conference on Signal and Information Processing (GlobalSIP 2013), Austin, TX, USA, December 2013.
- [C3] **D. S. Kalogerias**, S. Sun and A. P. Petropulu, "Sparse Sensing in Colocated MIMO Radar: A Matrix Completion Approach," 13th IEEE International Symposium on Signal Processing and Information Technology (ISSPIT 2013), Athens, Greece, December 2013 (*invited*).
- [C2] **D. S. Kalogerias** and A. P. Petropulu, "On the Coherence Properties of Random Euclidean Distance Matrices," 14th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC 2013), Darmstadt, Germany, June 2013.
- [C1] **D. S. Kalogerias**, N. Chatzipanagiotis, M. M. Zavlanos and A. P. Petropulu, "Mobile Jammers for Secrecy Rate Maximization in Cooperative Networks," 38th IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2013), Vancouver, Canada, May 2013.

Posters

- [P3] K. E. Nikolakakis, **D. S. Kalogerias**, and A. D. Sarwate, "Learning Tree Structures from Noisy Data," Rutgers ECE Research Day 2018, Department of Electrical & Computer Engineering, Rutgers, The State University of New Jersey, Piscataway, NJ, USA, November 2018.
- [P2] **D. S. Kalogerias** and A. P. Petropulu, "Spatially Controlled Relay Beamforming," 2017 Information Theory & Applications Workshop (ITA 2017), San Diego, CA, USA, February 2017 (*Graduation Day (GD) presentation*).
- [P1] **D. S. Kalogerias** and A. P. Petropulu, "On the Coherence Properties of Random Euclidean Distance Matrices," 1st IEEE/ACM workshop on Signal Processing Advances in Sensor Networks (SPAdS-Nets 2013), Philadelphia, PA, USA, April 2013.

Preprints, Technical Reports and Other Publications

- [R2] **D. S. Kalogerias** and A. P. Petropulu, "Spatially Controlled Relay Beamforming: 2-Stage Optimal Policies," extended preprint, May 2017. Available [here](#).
- [R1] **D. S. Kalogerias** and A. P. Petropulu, "Sequential channel state tracking & spatiotemporal channel prediction in mobile wireless sensor networks," CSPL Technical Report, Rutgers, The State University of New Jersey, 2015. Available [here](#).

Research Grants/Funding

NSF CCF 1526908, "Spatiotemporally Varying Channel Map Estimation and Tracking in Wireless Networks," 09/01/2015 - 08/31/2018, \$500,000, A. P. Petropulu (PI) and W. Trappe (co-PI) (*while being a graduate student*).

Talks (Invited & Contributed)

Zeroth-order Algorithms For Risk-Averse Optimization

INFORMS Annual Meeting, Seattle, WA, USA

Session on Risk-Averse Stochastic Programming: Theory and Applications 10/2019

Zeroth-order Recursive Optimization of Mean-Semideviation Risk Measures

The XV International Conference on Stochastic Programming, Trondheim, Norway

8/2019

Gradient-Based Recursive Risk-Averse Optimization

University of Pennsylvania, Philadelphia, PA, USA

PGM Group, Department of Electrical & Systems Engineering (ESE) 3/2019

Gradient-Based Recursive Risk-Averse Optimization

University of Pennsylvania, Philadelphia, PA, USA

Alelab, Department of Electrical & Systems Engineering (ESE) 3/2019

Recursive Optimization of Convex Risk Measures: Mean-Semideviation Models

INFORMS Annual Meeting, Phoenix, AZ, USA

General Session on Optimization for Robust and Risk-Aware Learning 11/2018

Recursive Optimization of Mean-Semideviation Risk Measures with Variable Assessment

University of Florida, Gainesville, FL, USA

Workshop on Risk Management Approaches in Engineering Applications 10/2018

Recursive Optimization of Mean-Semideviation Risk Measures with Variable Assessment

Siemens Corporate Technology, Princeton, NJ, USA

Autonomous Systems and Control Research Group 6/2018

Spatially Controlled Relay Beamforming

Stevens Institute of Technology, Hoboken, NJ, USA

Department of Electrical & Computer Engineering 5/2017

Enhancing QoS in Beamforming Networks: Mobile Beamformers and Optimal Motion Policies

55th IEEE Conference on Decision & Control (CDC 2016), Las Vegas, NV, USA

Workshop on Communication-Aware Control and Robotics 12/2016

Teaching Experience

Rutgers, The State University of New Jersey, Department of ECE

Teaching Assistant for "Probability and Random Processes" (undergraduate) *Spring 2015*

Head Teaching Assistant for "Linear Systems & Signals" (undergraduate) *Fall 2015*

Teaching Assistant for "Stochastic Signals & Systems" (graduate) *Fall 2013*

University of Patras, Greece, Department of Computer Engineering & Informatics

Teaching Assistant for "Digital Signal Processing" (undergraduate) *Spring 2012*

Teaching Assistant for "Digital Communications" (undergraduate) *Fall 2011*

Memberships and Technical Activities

Institute for Operations Research and the Management Sciences (INFORMS), Optimization Society

Institute of Electrical and Electronics Engineers (IEEE), Signal Processing Society, Control Systems Society

Journal Reviewer Activity:

SIAM Journal on Optimization (SIOPT), IEEE Transactions on Signal Processing (TSP), IEEE Transactions on Automatic Control (TAC), IEEE Transactions on Information Theory (TIF), IEEE Transactions on Signal & Information Processing over Networks (TSIPN), IEEE Transactions on Information Forensics & Security (TIFS), IEEE Transactions on Wireless Communications (TWC), IEEE Transactions on Neural Networks & Learning Systems (TNNLS), IEEE Sensors Journal, IEEE Signal Processing

Letters (SPL), MDPI Entropy, IET Signal Processing, EURASIP Journal on Wireless Communications and Networking.

Conference Reviewer Activity:

Conference on Neural Information Processing Systems (NeurIPS), International Conference on Machine Learning (ICML), IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), IEEE Conference on Information Sciences and Systems (CISS), IEEE Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), IEEE Global Communications Conference (GLOBECOM), IEEE Wireless Communications & Networking Conference (WCNC), European Signal Processing Conference (EUSIPCO).

Languages

English (Full Professional Fluency), Greek (Native)

Citizenships

Hellenic (Citizen of Greece)

Other Interests

Music Theory/Composition, Music/Sound Production, the Electric Guitar, Racquetball, Running, Swimming.

Courses (Registered/Audited)

Rutgers.....

- ▶ Stochastic Signals & Systems (ECE / Instructor: *Athina Petropulu*)
- ▶ Digital Signals & Filters (ECE / Instructor: *Waheed Bajwa*)
- ▶ Nonlinear Optimization (Operations Research - Rutcor / Instructor: *Jonathan Eckstein*)
- ▶ Computing Motion: Search, Planning, Control & Learning (Computer Science / Instructor: *Kostas Bekris*)
- ▶ Information Theory & Coding (ECE / Instructor: *Anand Sarwate*) (Audit)
- ▶ Independent Study on Measure Theoretic Probability & Nonlinear Filtering in Discrete Time (ECE)
- ▶ Statistical Learning & Optimization (ECE / Instructor: *Anand Sarwate*) (Audit)
- ▶ Independent Study on Approximate Nonlinear Filtering in Discrete Time (ECE)
- ▶ Advanced Probability Theory I (Statistics / Instructor: *Richard Gundy*)
- ▶ Advanced Probability Theory II (Statistics / Instructor: *Richard Gundy*)
- ▶ Independent Study on Multistage Stochastic Programming (ECE)
- ▶ Stochastic Processes (Statistics / Instructor: *Harry Crane*) (Audit)
- ▶ Dynamic Programming (MSIS - Business School / Instructor: *Andrzej Ruszczyński*) (Audit)

Princeton.....

- ▶ Stochastic Optimization (ORFE / Instructor: *Warren Powell*) (Audit)