Prof. Alejandro Ribeiro

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Teaching Statement

I am developing a novel approach to the teaching of signal processing better suited to the age of artificial intelligence (AI). My efforts include an undergraduate course on signal processing in which AI features prominently and AI lab experience for first year students in which signal processing features prominently. I have also developed a graduate course on graph neural networks (GNNs) based on my research whose online version has accumulated more than 130,000 views. I am a dedicated teacher who believes in the transformative power of education. I have received teaching awards from my students and colleagues.

Research Statement

I lead the signal processing group at the University of Pennsylvania. Our research advances the foundations of artificial intelligence (AI) and the use AI in networked systems. We have made seminal contributions to the theory and practice of graph signal processing in general and graph neural networks (GNNs) in particular. We have advanced foundations and algorithms for constrained learning in supervised, unsupervised, and generative settings. My research group has pioneered and continues to advance the use of GNNs and constrained learning in wireless communication networks and collaborative multiagent robotic systems.

Appointments

University of Pennsylvania — Philadelphia, Pennsylvania
Solomon & Sylvia G. Charp Professor — July 2024 - Present
Electrical & Systems Engineering

University of Pennsylvania — Philadelphia, Pennsylvania
Professor — July 2018 - July 2024
Electrical & Systems Engineering

University of Pennsylvania Philadelphia, Pennsylvania
Rosenbluth Associate Professor July 2014 - July 2018
Electrical & Systems Engineering

University of Pennsylvania Philadelphia, Pennsylvania
Assistant Professor July 2008 - July 2014
Electrical & Systems Engineering

University of Minnesota Minneapolis, Minnesota
Research Associate July 2007 - July 2008
Electrical & Computer Engineering

University of Minnesota Minneapolis, Minnesota
Research Assistant May 2003 - July 2007
Electrical & Computer Engineering

Bellsouth Montevideo, Uruguay
Systems Engineer November 1998 - April 2003
Engineering

Universidad de la República Oriental del Uruguay Montevideo, Uruguay
Research Assistant March 1997 - December 1998
Electrical Engineering

Universidad de la República Oriental del Uruguay Montevideo, Uruguay
Research Assistant August 1995 - February 1997
Physics

Education

University of Minnesota Minneapolis, Minnesota
Ph. D. in Electrical & Computer Engineering July 2007
Wireless Cooperative Communications and Networking
Advisor: Prof. Georgios B. Giannakis

University of Minnesota Minneapolis, Minnesota
M. Sc. in Electrical & Computer Engineering September 2005
Distributed Estimation in Wireless Sensor Networks
Advisor: Prof. Georgios B. Giannakis

Universidad de la República Oriental del Uruguay Montevideo, Uruguay
B. Sc. in Electrical Engineering December 1998

Academic Awards and Fellowships

- Outstanding Researcher Award, Intel University Research Programs (2019).
- Christian R. and Mary F. Lindback Award for Distinguished Teaching presented by the faculty of the University of Pennsylvania (2017).
- Penn fellow (2015).
- S. Reid Warren, Jr. Award presented by Penn's undergraduate student body for outstanding teaching (2012).
- Fulbright scholar (2003).

Paper Awards

- IEEE Signal Processing Society Best Paper Award (2024): "Convolutional Neural Network Architectures for Signals Supported on Graphs." IEEE Transactions on Signal Processing, vol 67, pp 1034-1049, February 2019. Coauthored with F. Gama, A. García Marques, and G. Leus.
- IEEE Signal Processing Society Best Paper Award (2022): "Graph Frequency Analysis of Brain Signals." IEEE Transactions on Signal Processing, vol 68, pp 5680-5695, September 2020. Coauthored with F. Gama and J. Bruna.
- IEEE Brain Initiative Student Paper Award for Weiyu Huang (2022): "Graph Frequency Analysis of Brain Signals." IEEE Journal of Selected Topics in Signal Processing, vol 10, pp 1189-1203, August 2016. Coauthored with L. Goldsberry, N. F. Wymbs, S. T. Grafton, and D. S. Bassett.
- Cambridge Ring Publication of the Year Award (2021): "Graph Neural Networks for Decentralized Multi-Robot Path Planning." IEEE/RSJ International Conference on Intelligent Robots and Systems, vol 1, pp 11785-11792, October 2020. Coauthored with Q. Li, F. Gama, and A. Prorok.
- IEEE Signal Processing Society Young Author Best Paper Award for Santiago Segarra (2020): "Network Topology Inference from Spectral Templates." IEEE Transactions on Signal and Information Processing over Networks, vol 3, pp 467-483, September 2017. Coauthored with Antonio García Marques and Gonzalo Mateos.
- Distinguished paper award by the International Consortium of Chinese Mathematicians (2018): "Decentralized Dynamic Optimization through the Alternating Direction Method

of Multipliers." IEEE Transactions on Signal Processing, vol 62, pp 1185– 1197, March 2014. Coauthored with Q. Ling..

- O. Hugo Schuck paper award (2014): "Optimal power management in wireless control systems." Proceedings of the American Control Conference, vol 1, pp 1562–1569, June 2013. Coauthored with K. Gatsis and G. Pappas..

Conference Paper Awards

- International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (2023). Student paper award for D. Owerko. "Multi-Target Tracking With Transferable Convolutional Neural Networks." Coauthored with C. Kanatsoulis, J. Bondarchuk, D. J. Bucci..

- European Signal Processing Conference (2021). Student paper award for Z. Wang. "Stability of Neural Networks on Riemannian Manifolds." Coauthored with L. Ruiz..

- International Conference on Acoustics, Speech and Signal Processing (2020). Paper award. "Better Safe than Sorry: Risk-Aware Nonlinear Bayesian Estimation." Coauthored with D. Kalogerias, L. Chamon and G. J. Pappas..

- International Conference on Acoustics, Speech and Signal Processing (2020). Student paper award for L. Chamon. "The Empirical Duality Gap of Constrained Statistical Learning." Coauthored with S. Paternain, and M. Calvo-Fullana..

- European Signal Processing Conference (2019). Student paper award for L. Ruiz. "Gated Graph Convolutional Recurrent Neural Networks." Coauthored with F. Gama..

- Conference on Decision and Control (2017). Student paper award for S. Paternain. "Safe Online Navigation of Convex Potentials in Spaces with Convex Obstacles." Coauthored with D. Koditscheck.

- Sensor Array and Multichannel Signal Processing Workshop (SAM (2016). Paper award. "Stationary Graph Processes: Nonparametric Power Spectral Estimation." Coauthored with S. Segarra, A. Garcia Marques, and G. Leus..

- Statistical Signal Processing Workshop (2016). Student paper award for S. Segarra. "Network Topology Identification from Spectral Templates." Coauthored with G. Mateos and A. Garcia Marques..

- Asilomar Conference on Signals Systems and Computers (2015). Student paper award for S. Segarra. "Sampling of graph signals: Successive local aggregations at a single node." Coauthored with A. Garcia Marques and G. Leus..

- American Control Conference (2013). Student paper award for K. Gatsis. "Optimal power management in wireless control systems." Coauthored with G. Pappas..

- International Conference on Acoustics, Speech and Signal Processing (2006). Student paper award. "SOI-KF: Distributed Kalman filtering with low-cost communications using the sign of innovations." Coauthored with Georgios B. Giannakis and Stergios I. Roumeliotis..

- International Conference on Acoustics, Speech and Signal Processing (2005). Student paper award. "Non-parametric distributed quantization-estimation using wireless sensor networks." Coauthored with Georgios B. Giannakis..

Sponsored Projects

(1) *Generative Graph Models at Scale: Discrete Diffusion, Transferability and Requirements* Award No: 2444713. USA National Science Foundation - Swiss National Science Foundation Collaboration. A. Ribeiro (Principal Investigator, USA) and P. Frossard (Principal Investigator, Switzerland) Awarded amount: $\$450,000$. (USA award only) October 2024 - September 2027.

(2) *Proactive Human-Autonomy Collaborative Teams (PHACT).* Lockheed Martin Corp. A. Ribeiro (Principal Investigator) and V. Kumar. Awarded amount: $\$500,000$. August 2021 - July 2024.

(3) *Deployment of Autonomous Ground Robots to Facilitate Communication.* Internet of Things for Precision Agriculture, NSF Engineering Research Center. A. Ribeiro (Principal Investigator), D. Cappelleri, S. Carpin, and V. Kumar. Awarded amount: $\$210,869.90$. December 2021 - December 2025.

(4) *AI Institute: TILOS: The Institute for Learning-enabled Optimization at Scale.* Award No: 2112665. National Science Foundation. V. Kumar (Principal Investigator), S. Bidokhti, H. Hassani, A. Ribeiro, and C. J. Taylor. Awarded amount: $\$2,790,000$ October 2021 - September 2026.

(5) *SIOP-DYNAM-O: Social Information/Opinion Dynamics and Optimization.* Award No: N/A. Department of Defense. R. Ghrist (Principal Investigator), V. Preciado, and A. Ribeiro. Awarded amount: $\$1,386,190$. December 2020 - December 2023.

(6) *Collaborative Research: Transferable, Hierarchical, Expressive, Optimal, Robust, Interpretable NETworks (THEORINET).* Award No: 2031895. National Science Foundation - Simons Research Collaborations on the Mathematical and Scientific Foundations of Deep Learning (MoDL). A. Ribeiro (Principal Investigator), E. Dobriban, R. Ghrist, and G. Pappas. Awarded amount: $\$2,000,000$. September 2020 - August 2025.

(7) *Penn1: Experimental Testbed on Wireless Autonomous Systems.* Award No: N/A. Office of Naval Research. V. Kumar (Principal Investigator), A. Hsieh, and A. Ribeiro. Awarded amount: $\$501,437$. August 2020 - July 2021.

(8) *Learning What to Sense and Communicate for Multi Vehicle Teams.* Award No: N/A. Office of Naval Research. V. Kumar (Principal Investigator) and A. Ribeiro. Awarded amount: $\$1,020,000$. May 2020 - April 2023.

(9) *HDR TRIPODS: FINPenn: Center for the Foundations of Information Processing at the University of Pennsylvania.* Award No: 1934960. National Science Foundation. A. Ribeiro (Principal Investigator), K. Daniilidis, E. Dobriban, R. Ghrist, and S. Sarkar. Awarded amount: $\$1,500,000$. September 2019 - August 2022.

(10) *PLUTO: Pennsylvania Laboratory for Underground Tunnel Operations.* Defense Advanced Research Projects Agency. C.J. Taylor (Principal Investigator), V. Kumar and A. Ribeiro. Awarded amount: $\$4,367,368$. September 2018 - August 2021.

(11) *Rethinking Communication and Control for Low-Latency, High Reliability loT Devices.* Award No: 1837253. National Science Foundation. G. Pappas (Principal Investigator), H. Hassani, and A. Ribeiro. Awarded amount: $\$1,000,000$. September 2018 - August 2021.

(12) *Distributed Collaborative Intelligent Systems Technology.* Contract No: W911NF-17-2-0181. Army Research Laboratory. A. Ribeiro (Program Manager). Awarded amount: $\$54,000,000$. December 2017 - December 2027.

(13) *Intel Science and Technology Center on Wireless Autonomous Systems (ISTC-WAS).* Intel Corp. A. Ribeiro (Center Director), F. Aflatouni, D. Lee, D. Katabi, V.Kumar, R. Mangharam, G. Pappas. Awarded amount: $1,500,000. October 2017 - October 2020.

(14) *Metric Representations of Network Data (Award No: 1717120)*, National Science Foundation. A. Ribeiro. Awarded amount: $450,000, August 2017 - August 2020.

(15) *Geometric and Graph Structures in Information Characterization and Extraction (Award No: W911NF1710438)*, Army Research Office. A. Ribeiro (principal investigator) and Joan Bruna. Awarded amount: $750,000, August 2017 - August 2020.

(16) *Optimal Communication for faster sensor network coordination (Award No: 1302222)*, National Science Foundation. M. Zavlanos (principal investigator), V. Preciado, and A. Ribeiro. Awarded amount: $774,000, October 2013 - October 2016.

(17) *CoDoN: Categorification of Data over Networks (Award No: 1304-560288)*, DARPA Defense Sciences Office. R. Ghrist (principal investigator) and A. Ribeiro. Awarded amount: $1,300,000, July 2012 - June 2016.

(18) *New Paradigms for Scalable, Online, Decentralized Optimization (Award No: N00014-12-1-0997)*, Office of Naval Research. A. Jadbabaie (principal investigator), A. Ozdaglar, A. Rahklin, and A. Ribeiro. Awarded amount: $1,500,000, July 2012 - July 2017.

(19) *Circles of Trust: An Axiomatic Construction of Clustering in Asymmetric Networks (Award No: 1217963)*, National Science Foundation, Division: Computer and Communications Foundations. A. Ribeiro (principal investigator). Awarded amount: $305,215, August 2012 - July 2015.

(20) *Control Science for Next Generation Sensing (Award No: FA9550-10-1-0567)*, Air Force Office of Scientific Research, Multi-University Research Initiative. D. Koditschek (principal investigator), A. Jadbabie, V. Kumar, A. Ribeiro, University of Minnesota, University of California at Berkeley. Awarded amount: $7,000,000, November 2010 - October 2015.

(21) *CAREER: Towards a formal theory of wireless networking (Award No: 0952867)*, National Science Foundation, Division: Computer and Communications Foundations, Program: Communication and Information Theory. A. Ribeiro (principal investigator). Awarded amount: $400,000, September 2010 - August 2015.

(22) *Distributed statistical inference of dynamic systems with sensor networks (Award No: 1017454)*, National Science Foundation, Division: Computer and Communications Foundations, Program: Sensor Networks. A. Ribeiro (principal investigator). Awarded amount: $300,000, September 2010 - August 2013.

(23) *Theoretical foundations of wireless networks (Award No: W911NF-10-1-0388)*, Army Research Office, Network Sciences Division. A. Ribeiro (principal investigator). Awarded amount: $300,000, August 2010 - July 2013.

(24) *Micro Autonomous Systems and Technology Collaborative Technology Alliance, Center for Communication, Networking and Coordination (Contract No: W911NF-08-2-0004)*, Army Research Laboratory. A. Ribeiro (Deputy Program Manager). Awarded amount: $22,000,000, November 2009 - October 2017.

(25) *Quantitative analysis and design of control networks (Award No: 0931239)*, National Science Foundation, Division: Computer and Network Systems, Program: Computer Systems, Information Technology Research. G. Pappas (principal investigator), R. Alur, I. Lee, R. Mangharam, and A. Ribeiro. Awarded amount: $1,509,319, September 2009 - August 2013.

Keynotes and Plenaries

(1) Asilomar Conference on Signals Systems and Computers. Plenary. *Learning with Constraints.* October 26, 2025.

(2) Boston University Reinforcement Learning Day. Plenary. *Constrained Reinforcement Learning.* May 10, 2024.

(3) International Federation for Information Processing Performance Workshop. Plenary. *Graph Neural Networks in Decentralized Control.* November 17, 2023.

(4) Norbert Wiener Center Fall Fourier Talks. Plenary. *Machine Learning on Large Scale Graphs: Limit Properties of Convolutional Operators on Graphs.* October 27, 2023.

(5) MIT Lincoln Laboratory's Graph Exploitation Symposium. Plenary. *Machine Learning on Large Scale Graphs: Limit Properties of Convolutional Operators on Graphs.* August 15, 2023.

(6) Distributed Collaborative Intelligent Systems Technology Collaborative Research Alliance (DCIST) Annual Meeting. Plenary. *Perception-Action-Communication Loops with Graph Neural Networks.* August 14, 2023.

(7) Workshop on Resource-Constrained Learning in Wireless Networks at the Conference on Machine Learning and Systems. Plenary. *Autonomous Wireless Communication Networks.* June 8, 2023.

(8) Khipu: Latin American Meeting In Artificial Intelligence. Keynote. *Graph Neural Networks.* March 7, 2023.

(9) Centro Interdisciplinario en Ciencia de Datos y Aprendizaje Automático (CICADA). Annual Meeting. Keynote. *Learning in Multiagent Autonomous Systems.* December 17, 2021.

(10) Mathematical and Scientific Foundations of Deep Learning. Annual Meeting. Keynote. *Learning under Requirements.* October 1, 2021.

(11) Semiconductor Research Corporations (SRC), Semiconductor Industry Association (SIA), and Department of Energy (DoE). Decadal Plan Workshop on New Trajectories for Communication. Plenary. *Wireless Autonomous Systems.* February 11, 2020.

(12) Intel Labs Open House. Keynote. *Graph Neural Networks.* October 9, 2019.

(13) European Signal Processing Conference. Plenary. *Graph Neural Networks.* September 3, 2019.

(14) Graph Signal Processing Workshop. Plenary. *Graph Neural Networks.* June 7, 2019.

(15) Workshop on Machine Learning in Wireless Communications at the International Conference on Communications. Keynote. *The Equivalence of Optimal Resource Allocation in Wireless Communications and Unsupervised Learning.* May 24, 2019.

(16) Global Signal Processing Conference. Plenary. *Statistical Signal Processing on Graphs.* December 9, 2016.

(17) ENS Lyon Thematic Semester on Network Science: Dynamics On and Of Networks. Plenary. *Graph Signal Processing Tools for Distributed Sampling and Topology inference.* June 20, 2016.

(18) 1st IEEE/ACM Workshop on Signal Processing Advances in Sensor Networks (CPSWeek). Keynote. *Bayesian Network Games.* April 8, 2013.

(19) IEEE New Technologies Conference at Boeing. Plenary. *Robust Control of Mobility and Communications in Autonomous Robot Teams.* August 9, 2011.

Tutorials and Short Courses

(1) European Signal Processing Conference. *Learning with Covariance Matrices: Foundations and Applications.* September 8, 2025.

(2) AAAI Conference on Artificial Intelligence *Graph Neural Networks: Architectures, Fundamental Properties and Applications.* February 25, 2025.

(3) European Signal Processing Conference. *Learning under Requirements: Supervised and Reinforcement Learning with Constraints.* August 22, 2024.

(4) Learning for Dynamics and Control Conference *Learning under Requirements: Supervised and Reinforcement Learning with Constraints.* July 15, 2024.

(5) AAAI Conference on Artificial Intelligence *Learning under Requirements: Supervised and Reinforcement Learning with Constraints.* February 20, 2024.

(6) IEEE International Conference on Acoustics, Speech and Signal Processing. *Short Course on Graph Neural Networks.* June 6-9, 2023.

(7) Workshop on the Analytical Foundations of Deep Learning. C3.ai Digital Transformation Institute. *Foundations of Graph Neural Networks.* October 19, 2020.

(8) IEEE International Conference on Acoustics, Speech and Signal Processing. *Graph Neural Networks.* May 5, 2020.

(9) IEEE-SPS / EURASIP Summer School on Network- and Data-driven Learning: Fundamentals and Applications. *Graph Convolutional Neural Networks.* May 20-24, 2019.

(10) IEEE International Conference on Acoustics, Speech and Signal Processing. *Graph Signal Processing.* March 5, 2017.

(11) European Signal Processing Conference. *Graph Signal Processing.* August 29, 2016.

(12) IEEE Sensor Array and Multichannel Signal Processing Workshop. *Graph Signal Processing.* July 10, 2016.

Seminars and Invited Talks

(1) University of Pennsylvania. Computer Science. Seminar. *Constrained Reinforcement Learning.* October 25, 2024.

(2) University of Pennsylvania. IDEAS Institute for Data Science. Seminar. *Constrained Reinforcement Learning.* September 19, 2024.

(3) University of California at San Diego. The Institute for Learning-Enabled Optimization at Scale. Invited Talk. *Primal-Dual Continual Learning: Stability and Plasticity through Lagrange Multipliers.* June 20, 2024.

(4) University of California at San Diego. The Institute for Learning-Enabled Optimization at Scale. Invited Talk. *Learning Enabled Optimization at Scale in Wireless Communications and Networking.* June 18, 2024.

(5) Data-driven Signal Processing, NextG Communications, and Networking Workshop. Expert Talk. *Intelligent Autonomous Networks.* May 18, 2024.

(6) Drexel University. Applied Mathematics. Colloquium. *Machine Learning on Large Scale Graphs: Limit Properties of Convolutional Operators on Graphs.* November 15, 2023.

(7) Office of Naval Research Science of Autonomy Meeting. Invited Talk. *Learning What to Sense and Communicate for Multi-Vehicle Teams.* August 1, 2023.

(8) University of California at San Diego. The Institute for Learning-Enabled Optimization at Scale. Invited Talk. *Lagrangian Duality in Constrained Learning: Resilient, Active, and Continual Learning.* July 17, 2023.

(9) Department of Defense Basic Research Office Socio-Math Program Review Meeting. Invited Talk. *Algebraic Convolutional Filters and Neural Networks.* April 28, 2023.

(10) Khipu: Latin American events in AI. Event Series in Artificial Intelligence. Seminar. *Stability Properties of Graph Neural Networks.* October 26, 2021.

(11) Microsoft Research. Networking Seminar Series. Seminar. *Learning Optimal Resource Allocations in Wireless Communication Systems.* September 1, 2021.

(12) National Science Foundation. Transdisciplinary Research in Principles of Data Science (TRIPODS) PI Meeting. Invited Talk. *Learning under Requirements.* June 11, 2021.

(13) Hamilton Institute. MIT-Harvard Communications Information Networks Circuits and Signals (CINCS). Seminar. *Learning Optimal Resource Allocations in Wireless Communications Systems.* May 19, 2021.

(14) Tufts University. Electrical and Computer Engineering. Seminar. *Algebraic Neural Networks: Stability to Deformations* April 16, 2021.

(15) Conseil Européen pour la Recherche Nucléeaire (CERN) Physics ∩ ML. Seminar. *Algebraic Neural Networks: Stability to Deformations.* March 24, 2021.

(16) University of Pennsylvania. Workshop on Equivariance and Data Augmentation. Invited Talk. *Algebraic Neural Networks: Symmetry and Stability.* September 4, 2020.

(17) University of Rochester. Electrical and Systems Engineering. Guest Lecture. *Graph Neural Networks.* October 23, 2019.

(18) Distributed Collaborative Intelligent Systems Technology Collaborative Research Alliance. Annual Meeting. University of Southern California. *Joint Resource Allocation in Perception-Action-Communication Loops.* March 3, 2019.

(19) Workshop on Machine Learning for Network Data. New York University. Invited Talk. *Invariance and Stability Properties of Graph Neural Networks.* January 29, 2019.

(20) Delft University of Technology. Faculty of Electrical Engineering, Mathematics and Computer Science Seminar. *Graph Neural Networks.* January 28, 2019.

(21) Joint Mathematics Meetings. Invited Talk. *Graph Neural Networks and Graph Scattering Transforms.* January 18, 2019.

(22) Intel Labs. Intel Science and Technology Center for Wireless Autonomous Systems Annual Meeting. Invited Talk. *Learning Resource Allocations in Wireless Communication Systems.* October 5, 2018.

(23) New York University. Center for Data Science and Courant Institute. Seminar. *Convolutional Neural Networks Architectures for Signals Supported on Graphs.* March 29, 2018.

(24) Harvard University. Department of Electrical Engineering. Seminar. *Statistical Signal Processing on Graphs.* October 20, 2017.

(25) Intel Science and Technology Center for Wireless Autonomous Systems Kickoff Meeting. Intel Labs. Feature Talk. *Wireless Autonomous Systems.* October 2, 2017.

(26) Lehigh University. Department of Industrial and Systems Engineering Seminar. *High Order Methods for Empirical Risk Minimization.* September 19, 2017.

(27) Army Research Laboratory, Micro Autonomous Systems and Technology Collaborative Technology Alliance, Capstone meeting, *Mobile Autonomous Wireless Networks*, August 22, 2016.

(28) DIMACS Workshop on Distributed Optimization, Information Processing, and Learning, Rutgers University, Invited talk, *High-order Methods In Empirical Risk Minimization*, August 21, 2017.

(29) ONR Basic Research Challenge on Decentralized Online Optimization, Review meeting, *Incremental Quasi-Newton Methods with Local Superlinear Convergence Rate*, April 28, 2017.

(30) Quintile IMS, Seminar, *Rating Prediction via Graph Signal Processing*, April 18, 2017.

(31) IPAM Workshop on Emerging Wireless Networks, University of California at Los Angeles, Invited talk, *High order methods in empirical risk minimization*, February 7, 2017.

(32) Workshop on Heterogeneity, Diversity and Resilience in Multi-Robot Systems, Invited talk, *Online Learning for Characterizing Unknown Environments in Robotic Vehicle Models*, August 15, 2016.

(33) Centre Tecnológic de Telecomunicacions de Catalunya (CTTC), Seminar, *Graph Signal Processing: Stationary Graph Signals and Topology Inference*, July 13, 2016.

(34) SIAM Annual Meeting, Invited talk, *Stability and continuity of centrality measures in weighted graphs*, July 13, 2016.

(35) École Polytehcnique Fédérale de Lausanne (EPFL), Seminar, *Graph signal processing tools for distributed sampling and topology inference*, July 7, 2016.

(36) Graph Signal Processing Workshop, Invited talk, *Stationarity and power spectral density estimation of graph signals*, May 26, 2016.

(37) Informs Optimization Society Conference, Invited talk, *Stochastic quasi-newton methods for large-scale optimization*, March 19, 2016.

(38) Army Research Laboratory, Micro Autonomous Systems and Technology Collaborative Technology Alliance, Review meeting, *Augmenting local control with statistical learning*, March 21, 2016.

(39) IBM research, Seminar, *Distributed optimization: Beyond first order methods*, October 28, 2015.

(40) Workshop on Foundations of Intelligent Sensing, Action and Learning, Invited talk, *Information, Complexity, and Representation of Autonomous Operation*, October 20, 2015.

(41) International Symposium on Optimization, *Convergence of stochastic quasi-Newton methods, Invited talk*, July 17, 2015.

(42) Yahoo research, Seminar, *Stochastic Quasi-Newton Methods*, June 30, 2015.

(43) Rutgers University, ECE Colloqium, *Axiomatic construction of hierarchical clustering in asymmetric networks*, March 25, 2015.

(44) Army Research Laboratory, Micro Autonomous Systems and Technology Collaborative Technology Alliance, Review meeting, *Decentralized network deployment for micro autonomous systems*, March 23, 2015.

(45) Information Theory and Applications Workshop, University of California at San Diego, Invited talk, *Network Newton*, February 5, 2015.

(46) University of Delaware, Seminar, *Axiomatic construction of hierarchical clustering in asymmetric networks*, October 6, 2014.

(47) Army Research Laboratory, Micro Autonomous Systems and Technology Collaborative Technology Alliance, Review meeting, *Decentralized network deployment for micro autonomous systems*, April 1, 2014.

(48) Information Theory and Applications Workshop, University of California at San Diego, Invited talk, *Hierarchical quasi-clustering methods for asymmetric networks*, February 13, 2014.

(49) Princeton University, Seminar, *Axiomatic construction of hierarchical clustering in asymmetric networks*, November 12, 2013.

(50) University of California at Los Angeles, Seminar, *Bayesian network games*, October 23, 2013.

(51) Army Research Laboratory, Micro Autonomous Systems and Technology Collaborative Technology Alliance, Review meeting, *Robust wireless networks for connectivity management*, March 29, 2013.

(52) Bellairs workshop on Signal Processing and Networks, McGill University, Invited talk, *Axiomatic construction of hierarchical clustering in asymmetric networks*, February 20, 2013.

(53) Information Theory and Applications Workshop, University of California at San Diego, Invited talk, *Bayesian quadratic network game filters*, February 14, 2013.

(54) Universidad de la Republica Oriental del Uruguay, Seminar, *Axiomatic construction of clustering in asymmetric networks*, December 12, 2012.

(55) Universidad de la Republica Oriental del Uruguay, Seminar, *Algorithms for controlling mobility while maintaining robust wireless connectivity*, December 11, 2012.

(56) Air Force Office of Scientific Research, Science of Information, Computation and Fusion, Review meeting, *MURI highlight technical talk: Asymmetric clustering*, December 5, 2012.

(57) Army Research Laboratory, Micro Autonomous Systems and Technology Collaborative Technology Alliance, Review meeting, *Robust wireless networks for connectivity management*, March 29, 2012.

(58) Pennsylvania State University, Seminar, *Optimal resource allocation in wireless communication and networking*, March 1, 2012.

(59) MAST Sensing, Perception, and Processing Thrust Research Directions Workshop, University of Michigan, Invited talk, *Communication issues in mobile micro autonomous systems*, February 24, 2012.

(60) Information Theory and Applications Workshop, University of California at San Diego, Invited talk, *Circles of trust: An axiomatic theory of clustering in asymmetric networks*, February 6, 2012.

(61) State University of New York at Buffalo, Seminar, *Optimal resource allocation in wireless communication and networking*, February 3, 2012.

(62) Air Force Office of Scientific Research, Science of Information, Computation and Fusion, Review meeting, *Hierarchical clustering of asymmetric data*, November 9, 2011.

(63) Stanford University, Seminar, *Optimal resource allocation in wireless communication and networking*, October 6, 2011.

(64) Cornell University, Seminar, *Optimal resource allocation in wireless communication and networking*, October 6, 2011.

(65) University of Delaware, Seminar, *Optimal resource allocation in wireless communication and networking*, May 2, 2011.

(66) Army Research Laboratory, Micro Autonomous Systems and Technology Collaborative Technology Alliance, Review meeting, *Robust wireless networks for connectivity management*, April 1, 2011.

(67) Princeton University, Seminar, *Optimal resource allocation in wireless communication and networking*, March 31, 2011.

(68) Northwestern University, Seminar, *Optimal resource allocation in wireless communication and networking*, March 11, 2011.

(69) Carnegie Mellon University, Seminar, *Optimal resource allocation in wireless communication and networking*, February 24, 2011.

Former Doctoral Students

Sourajit Das — University of Pennsylvania
graph Neural Networks for Communication in Multi-Agent Systems — August 2025

Damian Owerko — University of Pennsylvania
May 2025

Zhiyang Wang — University of Pennsylvania
Manifold Filters and Neural Networks: Geometric Graph Signal Processing in the Limit — May 2025

Juan Cerviño — University of Pennsylvania
Graph Machine Learning Under Requirements — June 2024

Harshat Kumar — University of Pennsylvania
Leveraging Models to Improve Data Efficiency: Navigation Reinforcement Learning, and Lie Group Convolutions — June 2023

Vinicius Lima — University of Pennsylvania
Control and Optimization over Large-Scale Networks — June 2023

Luana Ruiz University of Pennsylvania
Machine learning on large-scale graphs July 2022

Arbaaz Khan University of Pennsylvania
Graph Convolutions for Teams of Robots July 2021

Maria Peifer University of Pennsylvania
Balancing Fit And Complexity In Learned Representations June 2021

Ekaterina Tolstaya University of Pennsylvania
Scalable Learning in Distributed Robot Teams May 2021

Luiz Chamon University of Pennsylvania
Learning Under Requirements October 2020

Fernando Gama University of Pennsylvania
Foundations of Graph Neural Networks May 2020

Mark Eisen University of Pennsylvania
Machine Learning in Wireless Communication Systems August 2019

Weiyu Huang University of Pennsylvania
Network Data Analytics: Network Comparison and Applied Graph Signal Processing April 2018

Santiago Paternain University of Pennsylvania
Stochastic Control Foundations of Autonomous Behavior August 2018

Aryan Mokhtari University of Pennsylvania
Efficient Methods for Large-Scale Empirical Risk Minimization July 2017

Alec Koppel University of Pennsylvania
Stochastic Optimization for Multi-Agent Statistical June 2017

Learning and Control

Santiago Segarra University of Pennsylvania
Metric Representations of Networks August 2016

James Stephan University of Pennsylvania
Communication Aware Mobile Robot Teams August 2015

Ceyhun Eksin University of Pennsylvania
Bayesian Network Games January 2015

Yichuan Hu University of Pennsylvania
Distributed Algorithms for Optimal Design of Wireless Networks September 2013

Former Postdoctoral Researchers

Dongsheng Ding University of Pennsylvania
July 2022 - June 2025

Saurabh Sihag University of Pennsylvania
January 2021 - September 2024

Alejandro Parada University of Pennsylvania
September 2019 - September 2024

Charilaos Kanatsoulis University of Pennsylvania
October 2020 - December 2023

Navid Naderializadeh University of Pennsylvania
August 2021 - July 2023

Zebang Shen University of Pennsylvania
September 2020 - September 2022

Dionysios Kalogerias University of Pennsylvania
September 2019 - September 2020

Mikhail Gerasimenko University of Pennsylvania
July 2019 - December 2019

Elvin Isufi University of Pennsylvania
December 2018 - June 2019

Miguel Calvo Fullana University of Pennsylvania
September 2017 - September 2020

Current Doctoral Students

Ignacio Boero University of Pennsylvania
Degree Expected: Summer 2030

Romina García University of Pennsylvania
Degree Expected: Summer 2029

Beiming Li University of Pennsylvania
Degree Expected: Summer 2029

Antonio Pariente University of Pennsylvania
Degree Expected: Summer 2029

Javier Porras University of Pennsylvania
Degree Expected: Summer 2028

Fred Vatnsdal University of Pennsylvania
Degree Expected: Summer 2028

Shervin Khalafi University of Pennsylvania
Degree Expected: Summer 2028

Berkay Uslu University of Pennsylvania
Degree Expected: Summer 2027

Jiashu He University of Pennsylvania
Degree Expected: Summer 2027

Amanda Igwe University of Pennsylvania
Degree Expected: Summer 2027

Ignacio Hounie University of Pennsylvania
Degree Expected: Summer 2026

Samar Hadou University of Pennsylvania
Degree Expected: Summer 2026

Current Postdoctoral Researchers

Saurav Aggarwal University of Pennsylvania
July 2022 - September 2025

Courses Taught[1]

(1) *Artificial Intelligence Lab: Data, Models, and Decisions (ESE 2000).* University of Pennsylvania, Fall 2024. Instructor rating: 2.75. Class rating: 2.52. Enrollment: 127.

[1]Instructor and class ratings at the University of Pennsylvania are on a scale of 0 to 4. Ratings larger than 2 are considered good and ratings larger than 3 are considered excellent

(2) *Graph Neural Networks (ESE 5140).* University of Pennsylvania, Fall 2024. Instructor rating: 3.43. Class rating: 3.25. Enrollment: 136.

(3) *Artificial Intelligence Lab: Data, Models, and Decisions (ESE 2000).* University of Pennsylvania, Spring 2024. Instructor rating: 3.12. Class rating: 2.82. Enrollment: 54 (cap).

(4) *Signal and Information Processing (ESE 2240).* University of Pennsylvania, Spring 2024. Instructor rating: 2.87. Class rating: 2.55. Enrollment: 72.

(5) *Artificial Intelligence Lab: Data, Models, and Decisions (ESE 2000).* University of Pennsylvania, Spring 2023. Instructor rating: 3.52. Class rating: 3.17. Enrollment: 27 (cap).

(6) *Signal and Information Processing (ESE 2240).* University of Pennsylvania, Spring 2023. Instructor rating: 2.96. Class rating: 2.55. Enrollment: 65.

(7) *Signal and Information Processing (ESE 224).* University of Pennsylvania, Spring 2022. Instructor rating: 2.57. Class rating: 2.22. Enrollment: 56.

(8) *Graph Neural Networks (ESE 514).* University of Pennsylvania, Fall 2021. Instructor rating: 3.37. Class rating: 3.27. Enrollment: 44.

(9) *Signal and Information Processing (ESE 224).* University of Pennsylvania, Spring 2021. Instructor rating: 3.20. Class rating: 2.96. Enrollment: 58.

(10) *Graph Neural Networks (ESE 514).* University of Pennsylvania, Fall 2020. Instructor rating: 3.08. Class rating: 2.97. Enrollment: 27.

(11) *Signal and Information Processing (ESE 224).* University of Pennsylvania, Spring 2020. Instructor rating: 2.57. Class rating: 2.40. Enrollment: 79.

(12) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2019. Instructor rating: 2.32. Class rating: 1.88. Enrollment: 73.

(13) *Signal and Information Processing (ESE 224).* University of Pennsylvania, Spring 2019. Instructor rating: 2.69. Class rating: 2.68. Enrollment: 85.

(14) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2018. Instructor rating: 2.90. Class rating: 2.67. Enrollment: 63.

(15) *Signal and Information Processing (ESE 224).* University of Pennsylvania, Spring 2018. Instructor rating: 3.16. Class rating: 3.06. Enrollment: 75.

(16) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2017. Instructor rating: 2.83. Class rating: 2.51. Enrollment: 86.

(17) *Signal and Information Processing (ESE 224).* University of Pennsylvania, Spring 2017. Instructor rating: 2.90. Class rating: 2.58. Enrollment: 98.

(18) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2016. Instructor rating: 2.56. Class rating: 2.11. Enrollment: 75.

(19) *Signal and Information Processing (ESE 224).* University of Pennsylvania, Spring 2016. Instructor rating: 3.11. Class rating: 2.81. Enrollment: 91.

(20) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2015. Instructor rating: 3.04. Class rating: 2.71. Enrollment: 72.

(21) *Signal and Information Processing (ESE 224).* University of Pennsylvania, Spring 2015. Instructor rating: 2.88. Class rating: 2.73. Enrollment: 35.

(22) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2014. Instructor rating: 2.41. Class rating: 2.18. Enrollment: 57.

(23) *Modern convex optimization (ESE 605).* University of Pennsylvania, Spring 2014. Instructor rating: 2.92. Class rating: 2.97. Enrollment: 40.

(24) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2013. Instructor rating: 2.76. Class rating: 2.57. Enrollment: 47.

(25) *Optimal design of wireless systems (ESE 675).* University of Pennsylvania, Spring 2013. Instructor rating: 3.56. Class rating: 3.00. Enrollment: 3.

(26) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2012. Instructor rating: 3.24. Class rating: 2.93. Enrollment: 47.

(27) *Optimal design of wireless systems (ESE 675).* University of Pennsylvania, Spring 2012. Instructor rating: 3.56. Class rating: 3.00. Enrollment: 9.

(28) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2011. Instructor rating: 3.36. Class rating: 3.16. Enrollment: 49.

(29) *Special topics in Electrical and Systems Engineering: Optimal design of wireless networks (ESE 680).* University of Pennsylvania, Spring 2011. Instructor rating: 3.05. Class rating: 2.75. Enrollment: 10.

(30) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2010. Instructor rating: 3.16. Class rating: 2.65. Enrollment: 43.

(31) *Special topics in Electrical and Systems Engineering: Optimal design of wireless networks (ESE 680).* University of Pennsylvania, Spring 2010. Instructor rating: 3.57. Class rating: 3.21. Enrollment: 14.

(32) *Stochastic systems analysis and simulation (ESE 303).* University of Pennsylvania, Fall 2009. Instructor rating: 2.94. Class rating: 2.61. Enrollment: 37.

(33) *Data communications (ESE 408).* University of Pennsylvania, Spring 2009. Instructor rating: 4.00. Class rating: 4.00. Enrollment: 2.

Editorial Service

- IEEE Signal Processing Magazine. Associate editor (2018-2021).
- Special Issue on Graph Signal Processing. IEEE Journal of Selected Topics in Signal Processing and IEEE Transactions on Signal and Information Processing over Networks (joint issue). Guest Editor (2017).
- Special Issue on Cooperative Signal Processing for Heterogeneous and Multi-Task Wireless Sensor Networks. IEEE Journal of Selected Topics in Signal Processing. Guest Editor (2017).
- IEEE Transactions on Signal and Information Processing over Networks. Associate editor (2015-2018).
- Special Issue on Cooperative Communications in Wireless Networks. EURASIP Journal on Wireless Communications and Networking. Guest Editor (2009).

Workshop and Conference Service

- Graph Signal Processing Workshop. University of Minnesota. Steering Committee Member (2019).
- Workshop on Machine Learning for Network Data. New York University. Chair. (2019)
- Asilomar Conference on Signals Systems and Computers. Networks track. Technical area chair (2018).
- International Workshop on Signal Processing Advances in Wireless Communications. Special Session on Wireless Autonomous Systems. Chair (2018).
- Graph Signal Processing Workshop. École Polytehcnique Fédérale de Lausanne. Organizing Committee (2018).

- Data Science Workshop. École Polytehcnique Fédérale de Lausanne. Special Session on Convolutional Neural Networks for Graph Data. Chair (2018).

- DIMACS Workshop on Distributed Optimization, Information Processing, and Learning. Rutgers University. Organizing Committee (2017).

- Graph Signal Processing Workshop. Carnegie Mellon University. Organizing Committee (2017).

- IPAM Workshop on Emerging Wireless Networks. University of California at Los Angeles. Organizing Committee (2017).

- Asilomar Conference Signals Systems Computers. Networks track. Technical area chair (2016).

- IEEE Sensor Array and Multichannel Signal Processing Workshop. Special Session on Graph Signal Processing. Chair (2016).

- Graph Signal Processing Workshop. University of Pennsylvania. Chair (2016).

- International Conference Acoustics, Speech, Signal Processing Special Session on Recent Advances in the Emerging Field of Signal Processing on Graphs. Chair (2016).

- IEEE International Workshop. on Computational Advances in Multi-Sensor Adaptive Processing Special Session on Network Data and Graph Signal Processing. Chair (2015).

- Allerton Conference on Communication, Control and Computing. Special Session on Graph Signal Processing. Chair (2015).

- Signal Processing Society. Signal Processing for Communications Technical Committee. Member (2014-2016).

- Global Signal and Information Processing Conference Network Theory Symposium. Chair (2014).

- Global Signal and Information Processing Conference Network Theory Symposium. Chair (2013).

- Signal Processing Society. Signal Processing for Communications Technical Committee. Member (2011-2013).

- Asilomar Conference Signals Systems Computers. Networks track. Technical area chair (2011).

- International Conference on Acoustics, Speech and Signal Processing. External expert reviewer (2011).
- International Conference on Acoustics, Speech and Signal Processing. External expert reviewer (2010).
- International Conference on Acoustics, Speech and Signal Processing. External expert reviewer (2009).
- First Workshop on Distributed Estimation and Control in Networked Systems. Technical Program Committee (2009).

University Service

- Personnel Committee (2024-2026).
- Artificial Intelligence Undergraduate Major Development Group (2024-2025).
- Electrical and Systems Engineering Graduate Group Chair (2020-2022).
- Electrical and Systems Engineering Diversity Officer (2021-2024).
- Undergraduate Program Chair (2018-2022).
- Wireless Autonomous Systems Intel Science and Technology Center Director (2017-2020).
- Faculty Search Committee Chair (2018-2020).
- Ph.D. Colloquium Host (2015-2018).
- Electrical and Systems Engineering Graduate Group Chair (2015-2018).
- Student Disciplinary System Hearing Officer (2015-2017).
- Faculty Search Committee Member (2013-2017).
- Faculty Senate Elected Representative (2013-2015).
- Undergraduate Program Chair (2013-2015).

Journal Papers

(1) A. Tsiamis, D. S. Kalogerias, A. Ribeiro and G. J. Pappas, *"Linear Quadratic Control with Risk Constraints,"* Automatica 174:112095. April 2025.

(2) S. Das, N. Naderializadeh and A. Ribeiro, *"Learning State-Augmented Policies for Information Routing in Communication Networks,"* IEEE Transactions on Signal Processing 73:204-218. December 2024.

(3) S. Hadou, N. Naderializadeh and A. Ribeiro, *"Robust Stochastically-Descending Unrolled Networks,"* IEEE Transactions on Signal Processing 72:5484-5499. November 2024.

(4) A. Parada-Mayorga, L. Agorio, A. Ribeiro and J. A. Bazerque, *"Convolutional Filtering with RKHS Algebras,"* IEEE Transactions on Signal Processing (submitted). November 2024. Online: arxiv.org/abs/2411.01341.

(5) C. Liu, D. Liao, A. Parada-Mayorga, A. Ribeiro, M. DiStasio and S. Krishnaswamy, *"Diffkillr: Killing and Recreating Diffeomorphisms for Cell Annotation in Dense Microscopy Images,"* (submitted). October 2024. Online: arxiv.org/abs/2410.03058.

(6) M. Calvo-Fullana, M. Gerasimenko, D. Mox, L. Agorio, M. Del Castillo, V. Kumar, A. Ribeiro and J. A. Bazerque, *"A Networked Multiagent System for Mobile Wireless Infrastructure on Demand,"* Transactions on Robotics 40:4598-4614. September 2024.

(7) Juan Cervino, M. A. Turja, H. Mostafa, N. Himayat and A. Ribeiro, *"Distributed training of large graph neural networks with variable communication rates,"* (submitted). June 2024. Online: arxiv.org/abs/2406.17611.

(8) Z. Wang, L. Ruiz and A. Ribeiro, *"Geometric Graph Filters and Neural Networks: Limit Properties and Discriminability Trade-Offs,"* IEEE Transactions on Signal Processing 72:2244-2259. April 2024.

(9) X. Chen, N. Naderializadeh, A. Ribeiro and S. S. Bidohkti, *"Decentralized Learning Strategies for Estimation Error Minimization with Graph Neural Networks,"* (submitted). April 2024. Online: arxiv.org/abs/2404.03227.

(10) Z. Wang, L. Ruiz and A. Ribeiro, *"Stability to Deformations of Manifold Filters and Manifold Neural Networks,"* IEEE Transactions on Signal Processing 72:2130-2146. March 2024. Online: arxiv.org/abs/2106.03725.

(11) S. Sihag, G. Mateos, C. McMillan and A. Ribeiro, *"Transferability of coVariance Neural Networks,"* IEEE Journal on Selected Topics in Signal Processing 18(2):199-215. March 2024.

(12) C. Battiloro, Z. Wang, H. Riess, P. Di Lorenzo and A. Ribeiro, *"Tangent Bundle Convolutional Learning: From Manifolds to Cellular Sheaves and Back ,"* IEEE Transactions on Signal Processing 72:1892-1909. March 2024.

(13) H. Kumar, A. Parada-Mayorga and A. Ribeiro, *"Lie Group Algebra Convolutional Filters,"* IEEE Transactions on Signal Processing 72:2842-2857. February 2024. Online: arxiv.org/abs/2305.04431.

(14) G. Egan, M. Eisen, A. Ribeiro and S. Segarra, *"A Reply to Pervez Rizvi's Letter,"* Digital Scholarship in the Humanities 39(1):3-4. January 2024.

(15) A. Parada-Mayorga and A. Ribeiro, *"Sampling and Uniqueness Sets in Graphon Signal Processing,"* IEEE Transactions on Signal Processing (submitted). January 2024. Online: arxiv.org/abs/2401.06279.

(16) S. Agarwal, R. Muthukrishnan, W. Gosrich, V. Kumar and A. Ribeiro, *"Lpac: Learnable perception-action-communication loops with applications to coverage control,"* Transactions on Robotics (submitted). January 2024. Online: arxiv.org/abs/2401.04855.

(17) S. Sihag, G. Mateos, D. Wolk, A. Ribeiro and C. McMillan, *"Novel Framework for Brain Age Prediction using Graph Neural Networks,"* Alzheimer's Association International Conference 19(S17):e079038. December 2023.

(18) A. Parada-Mayorga, Z. Wang, F. Gama and A. Ribeiro, *"Stability of Aggregation Graph Neural Networks,"* IEEE Transactions on Signal and Information Processing over Networks 9:850-864. December 2023. Online: arxiv.org/abs/2207.03678.

(19) A. Parada-Mayorga, Z. Wang and A. Ribeiro, *"Graphon Pooling for Reducing Dimensionality of Signals and Convolutional Operators on Graphs,"* IEEE Transactions on Signal Processing 71:3577-3591. September 2023. Online: arxiv.org/abs/2212.08171.

(20) L. Ruiz, L. F. O. Chamon and A. Ribeiro, *"Transferability Properties of Graph Neural Networks,"* IEEE Transactions on Signal Processing 71:3474-3489. July 2023. Online: arxiv.org/abs/2112.04629.

(21) A. Parada-Mayorga, L. Butler and A. Ribeiro, *"Convolutional Filters and Neural Networks with Non Commutative Algebras,"* IEEE Transactions on Signal Processing 71:2683-2698. July 2023. Online: arxiv.org/abs/2108.09923.

(22) D. Owerko, C. Kanatsoulis, J. Bondarchuk, D. J. Bucci and A. Ribeiro, *"Transferability of Convolutional Neural Networks in Stationary Learning Tasks,"* IEEE Transactions on Signal Processing (submitted). July 2023. Online: arxiv.org/abs/2307.11588.

(23) S. Hadou, N. Naderializadeh and A. Ribeiro, *"Stochastic unrolled federated learning,"* IEEE Transactions on Signal Processing (submitted). May 2023. Online: arxiv.org/abs/2305.15371.

(24) G. Egan, M. Eisen, A. Ribeiro and S. Segarra, *""I would I had that corporal soundness": Pervez Rizvi's Analysis of the Word Adjacency Network Method of Authorship Attribution,"* Digital Scholarship in the Humanities 38(4):1494–1507. April 2023.

(25) N. Naderializadeh, M. Eisen and A. Ribeiro, *"Learning Resilient Radio Resource Management Policies With Graph Neural Networks,"* IEEE Transactions on Signal Processing 71:995-1009. March 2023. Online: arxiv.org/abs/2203.11012.

(26) L. Butler, A. Parada-Mayorga and A. Ribeiro, *"Convolutional Learning on Multigraphs,"* IEEE Transactions on Signal Processing 71:933-946. March 2023. Online: arxiv.org/abs/2209.11354.

(27) H. Kumar, A. Koppel and A. Ribeiro, *"On the Sample Complexity of Actor-Critic Method for Reinforcement Learning with Function Approximation,"* Machine Learning 112:2433–2467. February 2023. Online: arxiv.org/abs/1910.08412.

(28) Juan Cervino, L. Ruiz and A. Ribeiro, *"Learning by Transference: Training Graph Neural Networks on Growing Graphs,"* IEEE Transactions on Signal Processing 71:233-247. February 2023. Online: arxiv.org/abs/2106.03693.

(29) E. S. Lee, L. Zhou, A. Ribeiro and V. Kumar, *"Graph Neural Networks for Decentralized Multi-Agent Perimeter Defense,"* Frontiers in Control Engineering 4:1104745. January 2023. Online: arxiv.org/abs/2301.09689.

(30) M. Calvo-Fullana, S. Paternain, L. F. O. Chamon and A. Ribeiro, *"State Augmented Constrained Reinforcement Learning: Overcoming the Limitations of Learning with Rewards,"* IEEE Transactions on Automatic Control 99:1-15. January 2023. Online: arxiv.org/abs/2102.11941.

(31) N. Naderializadeh, M. Eisen and A. Ribeiro, *"State-Augmented Learnable Algorithms for Resource Management in Wireless Networks,"* IEEE Transactions on Signal Processing 70:5898-5912. December 2022. Online: arxiv.org/abs/2207.02242.

(32) H. Kumar, S. Paternain and A. Ribeiro, *"Navigation of a Quadratic Potential with Ellipsoidal Obstacles,"* Automatica 146:110643. December 2022. Online: arxiv.org/abs/1908.08509.

(33) Z. Gao, F. Gama and A. Ribeiro, *"Spherical Convolutional Neural Networks: Stability to Perturbations in SO(3),"* EURASIP Journal on Signal Processing 196. October 2022. Online: arxiv.org/abs/2010.05865.

(34) D. Owerko, F. Gama and A. Ribeiro, *"Unsupervised Optimal Power Flow Using Graph Neural Networks,"* IEEE Transactions on Signal Processing . July 2022. Online: arxiv.org/abs/2107.09203.

(35) Z. Gao, F. Gama and A. Ribeiro, *"Wide and Deep Graph Neural Network with Distributed Online Learning,"* IEEE Transactions on Information Theory 70:3862-3877. July 2022. Online: arxiv.org/abs/2103.05134.

(36) L. F. O. Chamon, S. Paternain, M. Calvo-Fullana and A. Ribeiro, *"Constrained Learning with Non-Convex Losses,"* IEEE Transactions on Information Theory 69(3):1739-1760. July 2022. Online: arxiv.org/abs/2103.05134.

(37) V. Lima, M. Eisen, K. Gatsis and A. Ribeiro, *"Model-Free Design of Control Systems over Wireless Fading Channels,"* IEEE Transactions on Signal Processing 197:108540. July 2022. Online: arxiv.org/abs/2009.01751.

(38) A. Parada-Mayorga, L. Butler and A. Ribeiro, *"Convolutional filtering and neural networks with non commutative algebras,"* IEEE Transactions on Signal Processing (submitted). July 2022. Online: arxiv.org/abs/2108.09923.

(39) Z. Gao, A. Koppel and A. Ribeiro, *"Balancing Rates and Variance via Adaptive Batch-Size for Stochastic Optimization Problems,"* IEEE Transactions on Signal Processing 70:3693-3708. June 2022. Online: arxiv.org/abs/2007.01219.

(40) P. Brown, M. Eisen, S. Segarra, A. Ribeiro and G. Egan, *"How the Word Adjacency Network algorithm works,"* Digital Scholarship in the Humanities 37(2):321-335. June 2022.

(41) F. Gama, Q. Li, E. Tolstaya, A. Prorok and A. Ribeiro, *"Synthesizing Decentralized Controllers With Graph Neural Networks and Imitation Learning,"* IEEE Transactions on Signal Processing 70:1932-1946. April 2022. Online: arxiv.org/abs/2012.14906.

(42) S. Paternain, J. A. Bazerque and A. Ribeiro, *"Policy Gradient for Continuing Tasks in Non-stationary Markov Decision Processes,"* IEEE Transactions on Automatic Control 67(9):4467-4482. March 2022. Online: arxiv.org/abs/2010.08443.

(43) Z. Wang, M. Eisen and A. Ribeiro, *"Learning Decentralized Wireless Resource Allocations with Graph Neural Networks,"* IEEE Transactions on Signal Processing 70:1850-1863. March 2022. Online: arxiv.org/abs/2107.01489.

(44) S. Paternain, M. Calvo-Fullana, L. F. O. Chamon and A. Ribeiro, *"Safe Policies for Reinforcement Learning via Primal-Dual Methods,"* IEEE Transactions on Automatic Control 68(3):1321-1336. February 2022. Online: arxiv.org/abs/1911.09101.

(45) D. Mox, V. Kumar and A. Ribeiro, *"Learning Connectivity-Maximizing Network Configurations,"* IEEE Robotics and Automation Letters 7(2):5552-5559. January 2022.

(46) V. Lima, M. Eisen, K. Gatsis and A. Ribeiro, *"Large-Scale Graph Reinforcement Learning in Wireless Control Systems,"* IEEE Transactions on Control of Network Systems (submitted). January 2022. Online: arxiv.org/abs/2201.09859.

(47) T. K. Hu, F. Gama, T. Chen, W. Zheng, Z. Wang, A. Ribeiro and B. M. Sadler, *"Scalable Perception-Action-Communication Loops with Convolutional and Graph Neural Networks,"* IEEE Transactions on Signal and Information Processing over Networks 8:12-24. December 2021. Online: arxiv.org/abs/2106.13358.

(48) Z. Gao, M. Eisen and A. Ribeiro, *"Resource Allocation via Model-Free Deep Learning in Free Space Optical Communications,"* IEEE Transactions on Communications 70(2):920-934. November 2021. Online: arxiv.org/abs/2007.13709.

(49) Z. Gao, E. Isufi and A. Ribeiro, *"Stability of Graph Convolutional Neural Networks to Stochastic Perturbations,"* EURASIP Journal on Signal Processing 188:108216. November 2021. Online: arxiv.org/abs/2106.10526.

(50) Juan Cervino, J. A. Bazerque, M. Calvo-Fullana and A. Ribeiro, *"Multi-task Reinforcement Learning in Reproducing Kernel Hilbert Spaces via Cross-learning,"* IEEE Transactions on Signal Processing 69:5947-5962. October 2021. Online: arxiv.org/abs/2008.11895.

(51) E. Isufi, F. Gama and A. Ribeiro, *"EdgeNets: Edge Varying Graph Neural Networks,"* Pattern Analysis and Machine Intelligence 44(11):7457-7473. September 2021. Online: arxiv.org/abs/2001.07620 .

(52) L. Ruiz, L. F. O. Chamon and A. Ribeiro, *"Graphon Signal Processing,"* IEEE Transactions on Signal Processing 69:4961-4976. August 2021. Online: arxiv.org/abs/2003.05030.

(53) A. Khan, V. Kumar and A. Ribeiro, *"Large Scale Distributed Collaborative Unlabeled Motion Planning With Graph Policy Gradients,"* IEEE Robotics and Automation Letters 6(3):5340-5347. July 2021. Online: arxiv.org/abs/2102.06284.

(54) Z. Gao, E. Isufi and A. Ribeiro, *"Stochastic Graph Neural Networks,"* IEEE Transactions on Signal Processing 69:4428-4443. June 2021. Online: arxiv.org/abs/2006.02684.

(55) G. Leus, S. Segarra, A. Ribeiro and A. G. Marques, *"The Dual Graph Shift Operator: Identifying the Support of the Frequency Domain,"* Journal of Fourier Analysis and Applications 27(3):1-20. May 2021. Online: arxiv.org/abs/1705.08987.

(56) L. F. O. Chamon, A. Amice and A. Ribeiro, *"Approximately Supermodular Scheduling Subject to Matroid Constraints,"* IEEE Transactions on Automatic Control 67(3):1384-1396. April 2021. Online: arxiv.org/abs/2003.08841.

(57) L. Ruiz, F. Gama and A. Ribeiro, *"Graph Neural Networks: Architectures, Stability, and Transferability,"* Procedings of the IEEE 109(5):660-682. February 2021. Online: arxiv.org/abs/2008.01767.

(58) M. Calvo-Fullana, A. Pyattaev, D. Mox, Sergey Andreev and A. Ribeiro, *"Communications and Robotics Simulation in UAVs: A Case Study on Aerial Synthetic Aperture Antennas,"* IEEE Communications Magazine 59(1):22-27. February 2021.

(59) M. Calvo-Fullana, D. Mox, A. Pyattaev, J. Fink, V. Kumar and A. Ribeiro, *"ROS-NetSim: A Framework for the Integration of Robotic and Network Simulators,"* IEEE Robotics and Automation Letters 6(2):1120-1127. February 2021. Online: arxiv.org/abs/2101.10113.

(60) F. Gama, Q. Li, E. Tolstaya, A. Prorok and A. Ribeiro, *"Decentralized Control with Graph Neural Networks,"* IEEE Transactions on Signal Processing (submitted). December 2020. Online: arxiv.org/abs/2012.14906.

(61) L. Ruiz, F. Gama and A. Ribeiro, *"Gated Graph Recurrent Neural Networks,"* IEEE Transactions on Signal Processing 68:6303-6318. October 2020. Online: arxiv.org/abs/2002.01038.

(62) D. S. Kalogerias, M. Eisen, G. J. Pappas and A. Ribeiro, *"Model-Free Learning of Optimal Ergodic Policies in Wireless Systems,"* IEEE Transactions on Signal Processing 68:6272-6286. October 2020. Online: arxiv.org/abs/1911.03988.

(63) A. Koppel, G. Warnell, E. Stump, P. Stone and A. Ribeiro, *"Policy Evaluation in Continuous MDPs with Efficient Kernelized Gradient Temporal Difference,"* IEEE Transactions on Automatic Control 66(4):1856-1863. October 2020. Online: arxiv.org/abs/1709.04221.

(64) S. Paternain, J. A. Bazerque, A. Small and A. Ribeiro, *"Stochastic Policy Gradient Ascent in Reproducing Kernel Hilbert Spaces,"* IEEE Transactions on Automatic Control 66(8). October 2020. Online: arxiv.org/abs/1807.11274.

(65) F. Gama, J. Bruna and A. Ribeiro, *"Stability Properties of Graph Neural Networks,"* IEEE Transactions on Signal Processing 68:5680-5695. September 2020. Online: arxiv.org/abs/1905.04497.

(66) A. Parada-Mayorga and A. Ribeiro, *"Algebraic Neural Networks: Stability to Deformations,"* IEEE Transactions on Signal Processing 69:3351-3366. September 2020. Online: arxiv.org/abs/2009.01433.

(67) A. Mokhtari and A. Ribeiro, *"Stochastic Quasi-Newton Methods,"* Procedings of the IEEE 108(11):1906-1922. September 2020.

(68) M. Peifer and A. Ribeiro, *"Federated Classification using Parsimonious Functions in Reproducing Kernel Hilbert Spaces,"* (submitted). September 2020. Online: arxiv.org/abs/2009.03768.

(69) M. Calvo-Fullana, C. Anton-Haro, J. Matamoros and A. Ribeiro, *"Random Access Communication for Wireless Control Systems with Energy Harvesting Sensors,"* IEEE Transactions on Signal Processing 68:3961-3975. July 2020. Online: arxiv.org/abs/1801.10141.

(70) S. Paternain, S. Lee, M. M. Zavlanos and A. Ribeiro, *"Distributed Constrained Online Learning,"* IEEE Transactions on Signal Processing 68:3486-3499. June 2020. Online: arxiv.org/abs/1903.06310.

(71) A. Mokhtari, A. Koppel, M. Takac and A. Ribeiro, *"A Class of Parallel Doubly Stochastic Algorithms for Large-Scale Learning,"* Journal on Machine Learning Research 21(120):1-51. June 2020.

(72) H. Kumar, D. S. Kalogerias, G. J. Pappas and A. Ribeiro, *"Zeroth-order Deterministic Policy Gradient,"* (submitted). June 2020. Online: arxiv.org/abs/2006.07314.

(73) A. Khan, A. Ribeiro, V. Kumar and A. Francis, *"Graph Neural Networks for Motion Planning,"* (submitted). June 2020. Online: arxiv.org/abs/2006.06248.

(74) S. Paternain and A. Ribeiro, *"Stochastic Artificial Potentials for Online Safe Navigation,"* IEEE Transactions on Automatic Control 65(5):1985-2000. May 2020. Online: arxiv.org/abs/1701.00033.

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