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Professional Experience and Education

Massachusetts Institute of Technology, Cambridge, MA, 2004-present
Associate Director (2011-present), Laboratory for Information and Decision Systems
Professor (2008-present), Department of Electrical Engineering and Computer Science.
Finmeccanica Career Development Chair (2005-2008)
Associate Professor (2004-2008), Department of Electrical Engineering and Computer Science.

Swiss Federal Institute of Technology (ETH), Zurich, Switzerland, 2001-2004.
Assistant Professor in Analysis and Control Systems,
Department of Information Technology and Electrical Engineering (D-ITET).

California Institute of Technology, Pasadena, CA, 2000-2001.
Postdoctoral Scholar, Department of Control and Dynamical Systems.

California Institute of Technology, Pasadena, CA, 1996-2000.
PhD in Control and Dynamical Systems (CDS). Dissertation title: *Structured semidefinite programs and semialgebraic geometry methods in robustness and optimization*. Advisor: John Doyle.

University of Buenos Aires, Buenos Aires, Argentina, 1989-1994. Electronics Engineer.
Thesis title: *Robust identification of dynamical systems*. Advisor: Ricardo Sánchez Peña.

Honors and awards

IEEE (Institute of Electrical and Electronics Engineers) Fellow, 2015.

Farkas Prize of the INFORMS Optimization Society, 2013.

IEEE Antonio Ruberti Young Researcher Prize, IEEE Control Systems Society, 2011.

ICM (International Congress of Mathematicians) Invited Sectional Speaker, Hyderabad, India, 2010.

SIAM Activity Group on Control and Systems Theory (SIAG/CST) Prize, 2002-2005.

Donald P. Eckman award, American Automatic Control Council (AACC), 2005.

Finalist, Tucker Prize of the Mathematical Programming Society for the years 2000-2003.

Professional activities

Science Advisory Board, Institute for Pure and Applied Mathematics (IPAM), UCLA, Los Angeles, CA. (2015-present).

Steering Committee, Mathematical Theory of Networks and Systems (MTNS), (2006-present).

Editorial Board, MPS/SIAM Book Series on Optimization. (2008-2014).

Board of Directors of the Foundations of Computational Mathematics (FoCM) Society (2008-2011).

Co-organizer (with D. Bertsimas, M. Stillman, B. Sturmfels, M. Sudan, and R. Thomas) of the IMA Special Year on Applications of Algebraic Geometry, 2006-2007.

Advisory Panel, SIAM Activity Group on Algebraic Geometry (2012-2014).

Books

- G. Blekherman, P. A. Parrilo, R. Thomas (eds.), "Semidefinite optimization and convex algebraic geometry," *SIAM-MOS Series on Optimization*, Vol. 13, SIAM, 2013.

Selected journal publications

- D. Cifuentes, P. A. Parrilo, "An efficient tree decomposition method for permanents and mixed discriminants," *Linear Algebra and its Applications*, Vol. 493, pp. 45-81, 2016.

- H. Fawzi, J. Saunderson, P. A. Parrilo, "Equivariant Semidefinite Lifts and Sum-of-Squares Hierarchies," *SIAM Journal on Optimization*, Vol. 25, No. 4, pp. 2212-2243, 2015.

- M. Gürbüzbalaban, A. Ozdaglar, P. Parrilo, "A globally convergent incremental Newton method," *Mathematical Programming*, Vol. 151, no. 1, pp. 283-313, 2015.

- H. Fawzi, J. Gouveia, P. A. Parrilo, R. Z. Robinson, R. R. Thomas, "Positive semidefinite rank," *Mathematical Programming*, Vol. 153, No. 1, 133-177, 2015.

- J. Saunderson, P. A. Parrilo, "Polynomial-sized semidefinite representations of derivative relaxations of spectrahedral cones," *Mathematical Programming*, Vol. 153, No. 2, pp. 309-331, 2015.

- O. Candogan, A. Ozdaglar, P. A. Parrilo, "Iterative Auction Design for Tree Valuations," *Operations Research*, Vol. 63, No. 4, pp. 751-771, 2015.

- J. Saunderson, P. A. Parrilo, A. Willsky, "Convex Solution to a Joint Attitude and Spin-Rate Estimation Problem," *Journal of Guidance Control and Dynamics*, pp. 1-10. January 2015

- J. Saunderson, P. A. Parrilo, A. Willsky, "Semidefinite Descriptions of the Convex Hull of Rotation Matrices," *SIAM Journal on Optimization*, Vol. 25, No. 3, pp. 1314-1343, 2015.

- H. Fawzi, P. A. Parrilo, "Lower bounds on nonnegative rank via nonnegative nuclear norms," *Mathematical Programming*, Vol. 153, pp. 41-66, 2015.

- A.A. Ahmadi, R. Jungers, P.A. Parrilo, and M. Roozbehani "Joint Spectral Radius and Path-Complete Graph Lyapunov Functions," *SIAM J. Control and Optimization*, Vol. 52, No. 1, pp. 687-717, 2014. ***2015 SIAG/CST Best SICON Paper Prize**

- J. Gouveia, P.A. Parrilo, and R. Thomas, "Lifts of convex sets and cone factorizations," *Mathematics of Operations Research*, Vol. 38, No. 2, pp. 248-264, 2013.

- P. Shah, P. A. Parrilo, "$\mathcal{H}_2$-Optimal Decentralized Control over Posets: A State-Space Solution for State-Feedback," *IEEE Transactions on Automatic Control*, Vol. 58, No. 12, pp. 3084-3096, 2013.

- A.A. Ahmadi, P.A. Parrilo, "A Complete Characterization of the Gap between Convexity and SOS-Convexity," *SIAM Journal on Optimization*, Vol. 23, No.2, pp. 811-833, 2013.

- O. Candogan, A. Ozdaglar and P.A. Parrilo, "Dynamics in Near-Potential Games," *Games and Economic Behavior*, Volume 82, pp. 66–90, 2013.

- A.A. Ahmadi, A. Olshevsky, P.A. Parrilo, J.N. Tsitsiklis, "NP-hardness of Deciding Convexity of Quartic Polynomials and Related Problems," *Mathematical Programming*, Vol. 137, Issue 1-2, pp 453-476, 2013. ***INFORMS Computing Society Prize**.

- V. Chandrasekaran, B. Recht, P.A. Parrilo, and A.S. Willsky, "The Convex Geometry of Linear Inverse Problems," *Foundations of Computational Mathematics*, Vol. 12, No. 6, pp. 805-849, 2012.

- V. Chandrasekaran, P.A. Parrilo, and A.S. Willsky, "Latent Variable Graphical Model Selection via Convex Optimization," *Annals of Statistics*, Vol. 40, No. 4, pp. 1935–1967, 2012.

- V. Chandrasekaran, S. Sanghavi, P.A. Parrilo and A. Willsky, "Rank-Sparsity Incoherence for Matrix Decomposition," *SIAM Journal on Optimization*, Vol. 21, Issue 2, pp. 572-596, 2011.

- N. Stein, P.A. Parrilo and A. Ozdaglar "Correlated Equilibria in Continuous Games: Characterization and Computation," *Games and Economic Behavior*, Vol. 71, No. 2, pp. 436-455, 2011.

- O. Candogan, I. Menache, A. Ozdaglar and P. A. Parrilo, "Flows and Decompositions of Games: Harmonic and Potential Games," *Mathematics of Operations Research*, Vol. 36, No. 3, pp. 474-503, 2011.

- B. Recht, M. Fazel and P.A. Parrilo, "Guaranteed Minimum-Rank Solutions of Linear Matrix Equations via Nuclear Norm Minimization," *SIAM Review*, Vol. 52, Issue 3, pp. 471-501, 2010.

- H. Men, N.-C. Nguyen, R.M. Freund, P.A. Parrilo and J. Peraire, "Band Gap Optimization of Two-Dimensional Photonic Crystals Using Semidefinite Programming and Subspace Methods," *Journal of Computational Physics*, Vol. 229, pp. 3706-3725, 2010.

- D. Bertsimas, D.A. Iancu and P.A. Parrilo, "Optimality of Affine Policies in Multi-stage Robust Optimization," *Mathematics of Operations Research*, Vol. 35, No. 2, pp. 363-394, 2010. ***INFORMS Optimization Society Student Paper Prize**

- J. Gouveia, P.A. Parrilo, and R. Thomas, "Theta Bodies for Polynomial Ideals," *SIAM J. Optim.*, Vol. 20, Issue 4, pp. 2097-2118, 2010.

- A. Nedic, A. Ozdaglar and P.A. Parrilo, "Constrained Consensus and Optimization in Multi-Agent Networks," *IEEE Transactions on Automatic Control*, Vol. 55, Issue 4, pp. 922-938, 2010.

- S. Boyd, P. Diaconis, P.A. Parrilo and L. Xiao, "Fastest mixing Markov chain on graphs with symmetries," *SIAM Journal on Optimization*, Vol. 20, Issue 2, pp. 792-819, 2009.

- H. Peyrl and P.A. Parrilo, "Computing sum of squares decompositions with rational coefficients," *Theoretical Computer Science*, Vol. 409, Issue 2, pp. 269-281, 2008.

- N. Stein, A. Ozdaglar, P.A. Parrilo, "Separable and low-rank continuous games," *International Journal of Game Theory*, Vol. 37, No. 4, pp. 457-474, 2008.

- L. Kuepfer, U. Sauer, P.A. Parrilo, "Efficient classification of complete parameter regions based on semidefinite programming," *BMC Bioinformatics*, Vol. 8, No. 12, 2007.

- P. A. Parrilo and A. Robertson, D. Saracino, "On the asymptotic minimum number of monochromatic 3-term arithmetic progressions," *Journal of Combinatorial Theory Ser. A*, Vol. 115:1, pp. 185–192, 2008.

- A. M. Childs, A. J. Landahl, P. A. Parrilo, "Improved quantum algorithms for the ordered search problem via semidefinite programming," *Phys. Rev. A*, Vol. 75, 032335, 2007.

- E. de Klerk, M. Laurent, P.A. Parrilo, "A PTAS for the minimization of polynomials of fixed degree over the simplex," *Theoretical Computer Science*, Vol. 361, pp. 210-225, 2006.

- S. Boyd, P. Diaconis, P.A. Parrilo, L. Xiao, "Symmetry analysis of reversible Markov chains," *Internet Mathematics*, Vol. 2, No. 1, 2005.

- A. S. Lewis, P. A. Parrilo, M. V. Ramana, "The Lax conjecture is true," *Proceedings of the AMS*, Vol. 133, pp. 2495-2499, 2005.

- K. Gatermann, P. A. Parrilo, "Symmetry groups, semidefinite programs, and sums of squares," *Journal of Pure and Appl. Algebra*, Vol. 192, No. 1-3, pp. 95-128, 2004.

- P. A. Parrilo, R. Peretz, "A geometric inequality for circle packings," *Discrete and Computational Geometry*, Vol. 31, No. 3, 2004.

- S. Prajna, P.A. Parrilo, A. Rantzer, "Nonlinear control synthesis by convex optimization," *IEEE Transactions on Automatic Control*, Vol. 49, No. 2, 2004

- A. C. Doherty, P. A. Parrilo, F. M. Spedalieri, "A complete family of separability criteria," *Phys. Rev. A*, Vol. 69, 022308, 2004.

- P. A. Parrilo, "Semidefinite programming relaxations for semialgebraic problems," *Mathematical Programming Ser. B*, Vol. 96, No. 2, pp. 293-320, 2003.

- A. C. Doherty, P. A. Parrilo, F. M. Spedalieri, "Distinguishing separable and entangled states," *Physical Review Letters*, Vol. 88, No. 18, 2002.

- M. Sznaier, T. Amishima, P. A. Parrilo, J. Tierno, "A Convex Approach to Robust $\mathcal{H}_2$ Performance Analysis," *Automatica*, Vol. 38, No. 6, 2002.

- P. A. Parrilo, S. Khatri, "On Cone-Invariant Linear Matrix Inequalities," *IEEE Transactions on Automatic Control*, Vol. 45, No. 8, 2000.

Selected plenary and invited presentations

- IEEE CDC (Conference on Decision and Control), Plenary Speaker, December 2017.

- SIAM Annual Meeting, Plenary Speaker, July 2016.

- LAA Speaker - 20th Conference of the International Linear Algebra Society (ILAS), KU Leuven, Belgium, July 2016.

- International Workshop on Operator Theory (IWOTA 2014), Amsterdam, The Netherlands, July 2014.

- Triangle Lectures in Combinatorics (TLC), UNC Chapel Hill, February 2014.

- International Congress of Mathematicians (ICM 2010), Control Theory and Optimization Section, Hyderabad, India, August 2010.

- 20th International Symposium on Mathematical Programming (ISMP), Chicago, August 2009.

- Foundations of Computational Mathematics (FoCM), Hong Kong, June 2008.

- XIXth International Workshop on Operator Theory and its Applications (IWOTA), July 2008.

- Second Mathematical Programming Society International Conference on Continuous Optimization (ICCOPT II), Hamilton, Ontario, Canada, August 2007.

- Eckman Prize lecture, American Control Conference, Minneapolis, June 2006.

- Hybrid Systems: Computation and Control (HSCC 2005). Swiss Federal Institute of Technology (ETH) Zurich, Switzerland, March 9-11, 2005

- International Symposium on Symbolic and Algebraic Computation (ISSAC 2004). University of Cantabria, Santander, Spain, July 4-7, 2004.

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