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Pablo A. Parrilo

Finmeccanica Career Development Professor of Engineering

Associate Director of LIDS

University of Buenos Aires, Electronics Engineering, 1994

BRIEF BIOGRAPHY

Since receiving his PhD, Professor Parrilo has held visiting appointments at the University of California at Santa Barbara (physics), the Lund Institute of Technology (automatic control), and UC Berkeley (mathematics). Before coming to MIT, he was an assistant professor at the Automatic Control Laboratory of the Swiss Federal Institute of Technology (ETH Zurich). He is currently on the Board of Directors of the Foundations of Computational Mathematics (FoCM) society, is an Associate Editor of the IEEE Transactions on Automatic Control, and a member of the Editorial Board of the MPS/SIAM Book Series on Optimization.

SELECTED PUBLICATIONS

Book and Book Chapters:

- P.A. Parrilo, "Exploiting algebraic structure in sum of squares programs," *Positive polynomials in Control*, Lecture Notes in Control and Information Sciences, Vol. 312, pp. 181-194, Springer, 2005.
- S. Prajna, A. Papachristodoulou, P. Seiler, P.A. Parrilo, "SOSTOOLS and its Control applications," *Positive polynomials in Control*, Lecture Notes in Control and Information Sciences, Vol. 312, pp. 273-292, Springer, 2005.
- P.A. Parrilo, B. Sturmfels, "Minimizing polynomial functions," *Algorithmic and quantitative real algebraic geometry*, DIMACS Series in Discrete Mathematics and Theoretical Computer Science, Vol. 60, pp. 83-99, AMS.

Journal Papers:

- N. Stein, A. Ozdaglar, and P.A. Parrilo "Separable and Low-Rank Continuous Games," *International Journal of Game Theory*, Vol. 37, No. 4, pp. 457-474, 2008.
- P.A. Parrilo and A. Jadbabaie, "Approximation of the joint spectral radius using sum of squares," *Linear Algebra and its Applications*, Vol. 428, No. 10, pp. 2385-2402, 2008.
- K. Gatermann and P.A. Parrilo, "Symmetry groups, semidefinite programs, and sums of squares," *Journal of Pure and Applied Algebra*, Vol. 192, No. 1-3, pp. 95-128, 2004.
- A. C. Doherty, P.A. Parrilo, and 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.

Conference Papers:

- E. Aylward, S. Itani, and P. A. Parrilo, "Explicit SOS decompositions of univariate polynomial matrices and the Kalman-Yakubovich-Popov Lemma," Proceedings of the 46th IEEE Conference on Decision and Control, New Orleans, 2007.
- H. Peyrl and P. A. Parrilo, "A Macaulay 2 package for computing sum of squares decompositions of polynomials with rational coefficients," Proceedings of the International Workshop on Symbolic-Numeric Computation, London, Ontario, Canada, pp. 207-208, 2007.
- P.A. Parrilo, "Polynomial games and sum of squares optimization," Proceedings of the 45th IEEE Conference on Decision and Control, San Diego, pp. 2855-2860, 2006.
- P.A. Parrilo, "Exploiting structure in sum of squares programs," Proceedings for the 42nd IEEE Conference on Decision and Control, Maui, Hawaii, 2003.
- S. Prajna, A. Papachristodoulou, and P.A. Parrilo, "Introducing SOSTOOLS: a general purpose sum of squares programming solver," Proceedings of the 41st IEEE Conference on Decision and Control, Las Vegas, USA, 2002.

SELECTED AWARDS

- 2005 Donald P. Eckman Award, American Automatic Control Council
- 2002-2005 SIAG/CST Prize, SIAM Activity Group on Control and Systems Theory

SELECTED GRANTS

- NSF Focused Research Group, "Semidefinite Optimization and Convex Algebraic Geometry" (2008-2011), joint with UCSD, UC Berkeley, and U. Washington
- AFOSR MURI, "Specification, Design and Verification of Distributed Embedded Systems," joint with Caltech and U. Washington
- NSF, "Optimization and Control of Stochastic Wireless Networks," joint with Asu Ozdaglar

COURSES TAUGHT

- 6.041/6.431: Probabilistic Systems Analysis and Applied Probability
- 6.255/15.093: Optimization Methods
- 6.256: Algebraic Techniques and Semidefinite Optimization



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Related Research:

[Sum of Squares and Polynomial Convexity](#)

[Non-monotonic Lyapunov Functions for Analysis of Nonlinear Systems](#)

[Lifts of polytopes and matrix factorization](#)

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