

Dario Paccagnan

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Dept. of Information Technology and Electrical Engineering

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Research Interests

My research interests are at the intersection between Distributed Control and Game Theory. My focus is on Game theoretic methods for coordination of large scale distributed systems. Applications include multiagent systems, resource allocation problems and energy systems' optimization.

Education

- Feb' 17 - Aug' 17 **Visiting Scholar**, *University of California, Santa Barbara*
Hosted by Prof. Jason Marden
- Jan' 15 - present **Ph.D. Student**, *ETH Zürich*, Automatic Control Laboratory
Advisor: Prof. John Lygeros
- Jan' 14 - Aug' 14 **Visiting Student**, *Imperial College of London*
Hosted by Prof. Alessandro Astolfi
- Sept' 12 - Aug' 14 **M.Sc. in Mathematical Modeling and Computation** (with Honors),
Technical University of Denmark
Thesis: Optimal Monitoring via Differential Games
Advisors: Prof. A. Astolfi and Prof. P.G. Hjorth
- Sept' 11 - Oct' 14 **M.Sc. in Aerospace Engineering** (110/110 Cum Laude), *University of Padova*
Advisors: Prof. M.E. Valcher and Prof. A. Astolfi
- Sept' 08 - July 11 **B.Sc. in Aerospace Engineering** (110/110 Cum Laude), *University of Padova*
Thesis: Active Constraints for Stabilization in Mechanical Systems
Advisor: Prof. Franco Rampazzo

Honors & Awards

- 2017 Fellow of the Swiss National Science Foundation,
Grant P1EZIP2-172122 on *Robustness of Distributed Control via Game Design*.
- 2012 - 2014 Fellow of the European T.I.M.E. Programme, in the pursuit of a double degree.
- 2014 M.Sc. in Mathematical Modeling and Computation awarded with special distinction by
the Technical University of Denmark.
- 2012 Admitted to the Elite Programme at the Technical University of Denmark.

Invited Talks

- Harvard University, J.A. Paulson School of Engineering and Applied Sciences
"The tradeoff between worst case and best case performance in multiagent systems", October 10, 2017.
- UC Riverside, Department of Mechanical Engineering
"The Tradeoff between Anarchy and Stability in Utility Design", August 18, 2017.
- University of Southern California, Ming Hsieh Dept. of Electrical Engineering
"Distributed optimisation through game design", July 31, 2017.
- UC Berkeley, Energy and Resources Group
"Nash Equilibria, Wardrop Equilibria and Utility Design in Distributed Control", July 25, 2017.

Publications

Journal Articles

- [1] D. Paccagnan and J.R. Marden The Importance of System-Level Information in Multiagent Systems Design: Cardinality and Covering Problems. Submitted to *IEEE Transactions on Automatic Control*; arXiv:1710.07460, 2017.
- [2] V. Ramaswamy, D. Paccagnan and J.R. Marden The Impact of Local Information on the Performance of Multiagent Systems. Submitted to *Science Robotics*; arXiv:1710.01409, 2017.
- [3] B. Gentile*, F. Parise*, D. Paccagnan*, M. Kamgarpour, and J. Lygeros. Nash and Wardrop equilibria in aggregative games with coupling constraints. Submitted to *IEEE Transactions on Automatic Control*; arXiv:1702.08789, 2017.

Book Chapters

- [4] D. Paccagnan*, B. Gentile*, F. Parise*, M. Kamgarpour and J. Lygeros. A game theoretic approach to decentralized charging of plug-in electric vehicles. *River Publishers*, 2018. Under final review.

Peer-reviewed Conference Articles

- [5] D. Paccagnan and J.R. Marden. The Risks and Rewards of Conditioning Noncooperative Designs to Additional Information. *Allerton Conference on Communication, Control, and Computing*, 2017.
- [6] B. Gentile, D. Paccagnan, B. Ogunbola and J. Lygeros. A Novel Concept of Equilibrium Over a Network. *IEEE Conference on Decision and Control*, 2017.
- [7] G. Burger, D. Paccagnan, B. Gentile, and J. Lygeros. On guarantees of convergence to a dynamic user equilibrium for a network of parallel roads. *IFAC World Congress*, 2017.
- [8] D. Paccagnan*, B. Gentile*, F. Parise*, M. Kamgarpour, and J. Lygeros. Distributed computation of generalized Nash equilibria in quadratic aggregative games with affine coupling constraints. *IEEE Conference on Decision and Control*, 2016.
- [9] D. Paccagnan, M. Kamgarpour, and J. Lygeros. On Aggregative and Mean Field Games with Applications to Electricity Markets. *European Control Conference*, 2016.
- [10] D. Paccagnan, M. Kamgarpour, and J. Lygeros. On the Range of Feasible Power Trajectories for a Population of Thermostatically Controlled Loads. *IEEE Conference on Decision and Control*, 2015.
- [11] M.J. Joergensen, D. Paccagnan, N.K. Poulsen, and M.B. Larsen. IMU Calibration and Validation in a Factory, Remote on Land and at Sea. *IEEE Position Location and Navigation Symposium*, 2014.

Teaching Experience

- Fall 17, Spring 18 Head Teaching assistant in Control Systems 1 (undergraduate course),
Department of Information Technology and Electrical Engineering, ETH Zürich.
- Spring 15, Spring 16 Teaching assistant in Nonlinear Systems and Control (graduate course),
Department of Information Technology and Electrical Engineering, ETH Zürich.
- Fall 15, Fall 16 Teaching assistant in Linear System Theory (graduate course),
Department of Information Technology and Electrical Engineering, ETH Zürich.

Advising Experience

Oct' 17 - present	Jean-Sébastien Brouillon, ETH Zürich. Master Thesis.
Apr' 17 - Nov' 17.	Sant Kumar, ETH Zürich. Master thesis: A decentralized fixed point algorithm for affine aggregative games.
Sept' 16 - Feb' 17.	Ogunsula Bolutife, ETH Zürich. Master Thesis: The location equilibrium and distributed dynamics to achieve it.
Mar' 16 - Aug' 16	Guillaume Burger, ETH Zürich. Semester Thesis: Dynamic route choice as an aggregative game.
Mar' 15 - Aug' 16	Albert Marc, ETH Zürich. Semester Thesis: Multi-Agent Route Choice as a Mean-Field Game.

Review Activity

Automatica ◦ IEEE Transactions on Automatic Control ◦ European Journal of Control ◦ IEEE Transactions on Control of Network Systems ◦ International Game Theory Review ◦ IEEE Transactions on Instrumentation and Measurement ◦ IEEE Conference on Decision and Control ◦ IFAC World Congress ◦ European Control Conference ◦ IEEE International Conference on Smart Grid Communications

Workshops and Summer Schools

July 17	Adaptive Learning: Theory, Data, and Applications, Stony Brook University.
July 15	SIAM Conference on Control and Its Applications (CT15).
Apr' 14	100th ESGI - European Study Group with Industry, University of Oxford.
July 13	European Summer School in Industrial Mathematics, Universidad Carlos III de Madrid.
June 12	14th Conf. on Hyperbolic Problems: Theory, Numerics and Applications, Univ. of Padova.
Sept' 11, Apr' 12	SADCO Workshops in Optimal Control, Imperial College London and ENSTA ParisTech.

Work Experience

Oct' 13 - Oct' 14	Founder of <i>INav Calibration</i> , Gyro and accelerometer calibration for inertial navigation.
Mar' 13 - Sept' 13	Joint Project between DTU Compute and ISIS srl, Inertial navigation techniques for iPhone.
Oct' 13 - Oct' 14	HR responsible and Board member at Erasmus Student Network.