

Dario Paccagnan



Automatic Control Laboratory
Swiss Federal Institute of Technology - ETH Zürich
ETL I 15, Physikstrasse 3
8092 Zürich, Switzerland

Email: dariop@control.ee.ethz.ch
Web: <http://control.ee.ethz.ch/~dariop>

Research Interests

My research interests lie at the intersection between Distributed Control and Game Theory. Applications include multiagent systems, resource allocation problems and optimization of energy systems.

Education

Visiting Scholar at University of California, Santa Barbara
Electrical and Computer Engineering Department
Hosted by Prof. Jason Marden
Feb' 2017 - Aug' 2017

Ph.D. Student at the Swiss Federal Institute of Technology - ETH Zürich
Automatic Control Laboratory
Advisor: Prof. John Lygeros
Jan' 2015 – now

Visiting Scholar at Imperial College of London
Department of Electrical and Electronic Engineering
Hosted by Prof. Alessandro Astolfi
Jan' 2014 – Aug' 2014

M.Sc. in Mathematical Modeling and Computation with Honors
Technical University of Denmark
Master Thesis: Optimal Monitoring via Differential Games.
Advisors: Prof. A. Astolfi, Prof. M.E. Valcher and Prof. P.G. Hjorth
Sept' 2012 – Aug' 2014

M.Sc. in Aerospace Engineering with Honors
Università degli studi di Padova
Sept' 2011 – Oct' 2014

B.Sc. in Aerospace Engineering with Honors
Università degli studi di Padova
Bachelor Thesis: Active Constraints for Stabilization in Mechanical Systems
Advisor: Prof. Franco Rampazzo
Sept' 2008 – July 2011

Fellowships & Awards

Fellow of the SNSF (Swiss National Science Foundation), grant P1EZP2-172122 on Distributed Control and Game theory.

Fellow of the European T.I.M.E. Programme, in the pursuit of a double degree.
Sept' 2012 – Aug' 2014.

M.Sc. in Mathematical Modeling and Computation awarded with special distinction by the Technical university of Denmark. Oct' 2014.

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.

UC San Diego, Department of Mechanical and Aerospace Engineering
“The Tradeoff between Anarchy and Stability in Utility Design”, July 21, 2017.

IFAC World Congress
“Guarantees of convergence to a dynamic user equilibrium for a single arc network”, July 17, 2017.

IEEE Conference on Decision and Control
“Generalized Nash equilibria in quadratic games with affine global constraints”, December 14, 2016.

International Symposium on Dynamic Games and Applications
“Distributed computation of Nash eq. in aggregative games with coupling constraints”, July 13, 2016.

Other Talks (In addition to conferences and invited talks)

Southern California Control Workshop, Caltech, USA
“Distributed Dynamics to Achieve a Location Equilibrium”, April 28, 2017.

Variational Inequalities, Nash Eq. Problems and Applications, Catania, Italy
“On the Convergence of Decentralized Algorithms to the Traffic User Equilibrium in a Road Network with Dynamics”, October 7, 2016.

Teaching

Teaching assistant in Nonlinear Systems and Control, ETH Zürich
Spring 2015, Spring 2016.

Teaching assistant in Linear System Theory, ETH Zürich
Fall 2015, Fall 2016.

Teaching assistant in Control Systems 1, ETH Zürich
Fall 2017.

Supervision

Master Thesis, Jean-Sébastien Brouillon, ETH Zürich, Oct' 2017 – now.

Master Thesis, Sant Kumar, ETH Zürich, Apr' 2017 – now.

The location equilibrium and distributed dynamics to achieve it
Master Thesis, Ogunsula Bolutife, ETH Zürich, Sept' 2016 – Feb' 2017.

Dynamic route choice as an aggregative game
Semester Thesis, Guillaume Burger, ETH Zürich, Mar' 2016 – Aug' 2016.

Multi-Agent Route Choice as a Mean-Field Game
Semester Thesis, Albert Marc, ETH Zürich, Mar' 2015 – Aug' 2016.

Review Activity

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

Adaptive Learning: Theory, Data, and Applications, Stony Brook University, July 2017.

100th ESGI - European Study Group with Industry, University of Oxford, Apr' 2014.

European Summer School in Industrial Mathematics and Modelling Week,
Universidad Carlos III de Madrid, July 2013

14th International Conference on Hyperbolic Problems:
Theory, Numerics and Applications, University of Padova, June 2012

S.A.D.C.O. Summer and Spring School Workshops in Optimal Control Theory,
Imperial College London - ENSTA ParisTech, Sept' 2011, Apr' 2012

Work Experience

Founder of *INav Calibration*

Gyro and accelerometer calibration for inertial navigation

Contractor of Sonardyne International Ltd

Oct' 2013 – Oct' 2014

Research Project between DTU Compute and ISIS s.r.l.

Inertial navigation techniques for iPhone

Mar' 2013 – Sept' 2013

HR responsible and Board member at Erasmus Student Network

Oct' 2013 – Oct' 2014

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; 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.

* denotes authors with equal contribution.

Peer-reviewed Conference articles

- [4] 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.
- [5] B. Gentile, D. Paccagnan, B. Oguniola and J. Lygeros. A Novel Concept of Equilibrium Over a Network. *IEEE Conference on Decision and Control*, 2017.
- [6] 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.
- [7] 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.
- [8] D. Paccagnan, M. Kamgarpour, and J. Lygeros. On Aggregative and Mean Field Games with Applications to Electricity Markets. *European Control Conference*, 2016.
- [9] 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.
- [10] 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.