

FRANCESCA PARISE
- CURRICULUM VITAE -

School of Electrical and Computer Engineering, Cornell University

<i>email</i>	fp264@cornell.edu
<i>date of birth</i>	10 October 1988
<i>nationality</i>	Italian
<i>last update</i>	Feb 2023

EDUCATION

INSTITUTION	DEGREE	DATE
University of Padova	<i>BS</i> in Information Engineering (110/110 cum Laude)	Jul 2010
University of Padova	<i>MS</i> in Control Engineering (110/110 cum Laude)	Jul 2012
Galilean School of Higher Education	<i>Completion Certificate</i> (100/100 cum Laude)	Jun 2013
ETH, Zurich	<i>Doctor of Sciences</i>	Mar 2017

TITLE OF DOCTORAL THESIS:

Inference and control for populations of systems: from aggregative games to systems biology

Available online: <https://doi.org/10.3929/ethz-a-010859584>

PhD advisor: Professor John Lygeros, ETH

Co-examiners: Professor John Tsitsiklis (MIT), Professor Maria Elena Valcher (Padova University)

PROFESSIONAL EXPERIENCE

<i>Assistant professor</i> , ECE, Cornell University (with field membership in SYSEN, CAM and CS)	Jul 2020 - present
<i>Visiting research scholar professor</i> , Simons Institute, Berkeley University	Aug 2022 - Dec 2022
<i>Visiting assistant professor</i> , ECE, Cornell University	Aug 2019 - Jun 2020
<i>Postdoctoral researcher</i> , EECS, MIT (Advisor: Prof. A. Ozdaglar)	Nov 2016 - Jun 2020

FIELDS OF INTEREST

Network, Control and Game Theory: Theory and Algorithms,
Social and Economic Networks: Learning, Information Dynamics, Contagion and Epidemic Models,
Network Economics: Pricing and Resource Allocation Games, Targeted Interventions,
Systems Biology: Biochemical Reaction Networks, Inference and Control

AWARDS, GRANTS and FELLOWSHIPS

<i>PCCW Affinito-Stewart Award</i>	May 2023
<i>Finalist ISSNAF Young Investigator Award</i>	Oct 2022

<i>C3.ai COVID-19 Award (jointly with Asuman Ozdaglar and Daron Acemoglu, MIT)</i>	July 2020
<i>SNSF Advanced Postdoc Mobility Fellowship (P300P2-177805)</i>	Dec 2017
<i>ETH Medal (Awarded to honor outstanding PhD dissertations at ETH Zurich)</i>	Dec 2017
<i>Participant of Rising Stars in EECS 2017 (By-invitation-only workshop)</i>	Nov 2017
<i>SNSF Early Postdoc Mobility Fellowship (P2EZP2-168812)</i>	Jun 2016
<i>Guglielmo Marin Award, Istituto Veneto di Scienze Lettere ed Arti</i>	May 2015
<i>Galilean School of Higher Education (http://www.unipd-scuolagalileiana.it/en/)</i>	Sep 2007
<i>National Mathematics and Physics Olympiad</i>	years 2004 to 2007

PROFESSIONAL SERVICE

Technical Program Committee:

- 4th L4DC Conference	2022
- IFAC Conference on Network Systems (IPC member)	2022
- 3rd L4DC Conference	2021
- COMPLEX NETWORKS 2020: 9th Intern. Conf. on Complex Networks and their Applications	2020
- 2nd L4DC Conference	2020

Other Committees:

- IEEE 61th Conference on Decision and Control (Student Activities Chair)	2022
---	------

Session/Cluster Organizer:

- Organizer of Open Invited Track at IFAC WC 2023	July 2023
- Chair and organizer of Invited Session at INFORMS 2018	Nov 2018
- Chair and organizer of Invited Session at IEEE CDC 2016	Dec 2016

Workshop/Seminar Series Organizer:

- <i>AsuFest, workshop on the frontier of games, optimization, networks, ML and operations. MIT</i>	June 2023
- Workshop on “Network and Games”, Institute for Mathematical Sciences, NUS, Singapore	Apr 2023
- Workshop on “Control for Autonomous Cities” at IEEE CDC 2021	Dec 2021
- Virtual seminar series on “Games, Decisions & Networks”	Winter-Spring-Fall 2021
- Workshop on “Dynamics in Social and Economic Networks” at IEEE CDC 2020	Dec 2020

Editor for:

- *Economics: Dynamic Games and Applications*

Reviewer for:

- Control: *Automatica*, *IEEE Transaction on Automatic Control (TAC)*, *IEEE Transactions on Control of Network Systems (TCNS)*, *IEEE Transaction on Control Systems Technology*, *IEEE Control Systems Magazine*, *IEEE Control Systems Letters*, *IEEE Conference on Decision and Control (CDC)*, *European Control Conference (ECC)*, *American Control Conference (ACC)*, *IFAC World Congress*,
- Optimization and Operations Research: *Mathematics of Operations Research*, *Journal of Optimization Theory and Applications*, *SIAM Journal on Optimization*, *European Journal of Operational Research*
- Economics: *International Economic Review*, *Review of Economic Studies*, *Games and Economic Behavior*, *Theoretical Economics*, *Transactions on Economics and Computation*, *Journal of Economic Theory*
- Others: *PNAS*, *PNAS Nexus*, *Communications Physics*

INVITED TALKS

Caltech, Computing and Mathematical Sciences	May 2023
NCCR Automation workshop, Switzerland - <u>Semi plenary speaker</u>	May 2023
DEGAS Seminar Series - IEEE SPS Data Science Initiative	Feb 2023
Politecnico of Torino, Italy - DISMA	Jan 2023
IEEE CDC22 - Workshop on Diversity and Inclusion	Dec 2022
Washington University - Electrical and Systems Engineering	Oct 2022
Simons Institute - Workshop on Graph Limits, Non-Parametric Models, and Estimation	Sep 2022
NecSys22, Zurich, Switzerland - <u>Plenary speaker</u>	Jul 2022
UIUC, ISE	April 2022
Syracuse University	April 2022
Boston University	April 2022
Cornell, CS Theory Seminar	December 2021
NeurIPS - Workshop on Learning and Decision-Making with Strategic Feedback	December 2021
IEEE CDC - COVID-19 Focus Workshop	December 2021
GERAD - Mean Field Games on Networks	October 2021
ETH - Autonomy Talk	October 2021
IMSI - Introduction to Mean Field Games and Applications	June 2021
SIAM - Conference on Financial Mathematics and Engineering	June 2021
UC Berkeley - Semiautonomous seminar	Apr 2021
Cornell, Center for Applied Mathematics - CAM Colloquium	May 2021
Cornell, Systems Engineering - Ezra's Round Table	May 2021
The Cambridge-INET Institute - Networks webinar	Jan 2021
Inaugural C3.ai Digital Transformation Institute Annual Research Symposium	Jan 2021
Luiss, Dipartimento di Economia e Finanza	Nov 2020
C3.ai Colloquium on Digital Transformation Science	Aug 2020
Politecnico di Torino, Workshop: Network Dynamics in Social, Economic & Financial Sciences	Nov 2019
Monash University, Department of Electrical and Computer Systems Engineering	May 2019
EPFL	May 2019

Oxford University, Department of Engineering Science	Apr 2019
Imperial College, Department of Computing	Apr 2019
Columbia, Electrical Engineering	Mar 2019
University of Illinois at Urbana-Champaign, Electrical and Computer Engineering	Mar 2019
Cornell, Electrical and Computer Engineering	Mar 2019
UCLA, Electrical and Computer Engineering	Feb 2019
Northwestern University, Industrial Engineering and Management Sciences	Feb 2019
Cornell Tech, Operations Research and Information Engineering	Feb 2019
Stanford, Graduate School of Business	Jan 2019
Caltech, Computing and Mathematical Sciences	Jan 2019
NETGCOOP 2018, Invited talk	Nov 2018
University of Pennsylvania, Electrical and Systems Engineering	Mar 2018
Santa Barbara University, Mechanical Engineering	Mar 2018
Boston University, CISE Graduate Student Workshop	Jan 2017

SUPERVISION

PhD students

- Shriya Nagpal	since 2021
- Michael Xu	since 2021
- Feras Al Taha	since 2021
- Kiran Rokade	since 2021
- Emily Meigs (co-supervision, MIT)	2017 - 2020

Master project supervision

- Emily Wang: (Cornell, M.Sc. level, 2021)
- Lukas Moeller: Constrained deterministic leader-follower mean field control (ETH, M.Sc. level, 2016)

Semester project supervision (ETH, M.Sc. level)

- S. Curi: Game theoretical analysis in energy markets (2016)
- M. Albert: Multi-agent route choice as a mean-field game (2016)
- B. Mottet: Application of a moment-based method for parameter inference to nonlinear stochastic population growth model (2015)

OUTREACH

High-school students

- Lecturer for Cornell's CURIE Academy	summer 2022
- Mentor for the Talaria Summer Institute by WiSTEM	summer 2022
- Judge for ENVISION by WiSTEM	winter 2021

TEACHING

Instructor for the courses:

- Theory of Linear Systems (Cornell, master/graduate level course) 2021, 2022
- Network Systems and Games (Cornell, master/graduate level course) 2020, 2021, 2023

Teaching assistant for the courses:

- Systems Biology Block Course (ETH, PhD level course) years 2015 to 2016
- Advanced Topics in Control (ETH, M.Sc. level course) spring 2015 to 2016
- Matlab Course (ETH, B.Sc. level course) fall 2013 to 2015
- Signal and Systems II (ETH, B.Sc. level course) spring 2013 to 2015

PUBLICATIONS

- Preprints

- [P1] K. Rokade, **F. Parise**. “Graphon Games with Multiple Nash Equilibria: Analysis and Computation.” (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4354931)
- [P2] D. Acemoglu, A. Fallah, A. Giometto, D. Huttenlocher, A. Ozdaglar, **F. Parise**, S. Pattathil. “Optimal adaptive testing for epidemic control: combining molecular and serology tests.” (<https://arxiv.org/abs/2101.00773>) Revise and resubmit, Automatica.
- [P3] E. Meigs, **F. Parise**, A. Ozdaglar, D. Acemoglu. “Optimal dynamic information provision in traffic routing.” (<https://arxiv.org/abs/2001.03232>)
- [P4] S. Erol, **F. Parise**, A. Teytelboym. “Contagion in Graphons.” (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3674691) Revise and resubmit, Journal of Economic Theory.

- Papers in Refereed Journals

- [J1] L. Cianfanelli, G. Como, A. Ozdaglar, **F. Parise**. “Optimal intervention in traffic networks.” *IEEE Transaction on Automatic Control*, 2023. (<https://arxiv.org/abs/2102.08441>)
- [J2] **F. Parise**, A. Ozdaglar. “Graphon Games.” *Econometrica*, 2023. (<https://arxiv.org/abs/1802.00080>)
- [J3] S.V. Nagpal, G.G. Nair, **F. Parise**, C.L. Anderson. “Designing for Robustness in Electric Grids via a General Effective Resistance Measure.” *IEEE Transactions on Control of Network Systems*, 2022. (<https://arxiv.org/abs/2201.00929>)
- [J4] S. Yan, **F. Parise**, E. Bitar. “Data-Driven Approximations of Chance Constrained Programs in Nonstationary Environments”. *IEEE Control Systems Letters*, 2022. (<https://arxiv.org/pdf/2205.03748.pdf>)
- [J5] M.O. Sayin, **F. Parise**, A. Ozdaglar. “Fictitious play in zero-sum stochastic games”. *SIAM Journal on Control and Optimization*, 2022 (<https://arxiv.org/abs/2010.04223>)

- [J6] **F. Parise**, A. Ozdaglar. “Analysis and Interventions in Large Network Games”. Annual Review of Control, Robotics, and Autonomous Systems, 2021 (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3692826).
- [J7] **F. Parise**, S. Grammatico, B. Gentile and J. Lygeros. “Network aggregative games and distributed mean field control via consensus theory”. *Automatica*, 2020. (<https://arxiv.org/abs/1506.07719>)
- [J8] **F. Parise***, B. Gentile* and J. Lygeros. “A distributed algorithm for average aggregative games with coupling constraints”, *IEEE Transactions on Control of Network Systems*, 2019. (<https://arxiv.org/abs/1706.04634>)
- [J9] **F. Parise**, A. Ozdaglar. “A variational inequality framework for network games: Existence, uniqueness, convergence and sensitivity analysis.” *Games and Economic Behaviour*, 2019. (<https://arxiv.org/abs/1712.08277>)
- [J10] M. Avella-Medina*, **F. Parise***, M.T. Schaub*, and S. Segarra*. “Centrality measures for graphons”. *IEEE Transactions on Network Science and Engineering*, 2018. (<https://arxiv.org/abs/1707.09350>)
- [J11] D. Paccagnan, **F. Parise** and J. Lygeros. “On the Efficiency of Nash Equilibria in Charging Games”. *IEEE Control Systems Letters*, 2018. (<https://arxiv.org/abs/1803.02583>)
- [J12] D. Paccagnan*, B. Gentile*, **F. Parise***, M. Kamgarpour and J. Lygeros. “Nash and Wardrop equilibria in aggregative games with coupling constraints”. *IEEE Transaction on Automatic Control*, 2018. (<https://arxiv.org/abs/1702.08789>)
- [J13] **F. Parise**, M.E. Valcher and J. Lygeros. “Computing the projected reachable set of stochastic biochemical reaction networks modelled by switched affine systems”. *IEEE Transaction on Automatic Control*, 2018. (<https://arxiv.org/abs/1705.00400>)
- [J14] S. Grammatico, **F. Parise**, M. Colombino and J. Lygeros. “Decentralized convergence to Nash equilibria in constrained deterministic mean field control”. *IEEE Transaction on Automatic Control*, vol. 61, no. 11, pp. 3315–3329, 2016. (<https://arxiv.org/abs/1410.4421>)
- [J15] **F. Parise**, J. Lygeros, J. Ruess. “Bayesian inference for stochastic individual-based models of ecological systems: a pest control simulation study”. *Frontiers in Environmental Science*, vol. 3, no. 42, 2015. (<https://doi.org/10.3389/fenvs.2015.00042>)
- [J16] J. Ruess*, **F. Parise***, A. Miliadis-Argeitis, M. Khammash, J. Lygeros. “Iterative experiment design guides the characterization of a light-inducible gene expression circuit”. *Proceedings of the National Academy of Sciences (PNAS)*, vol. 112, no. 26, pp. 8148–8153, 2015. (<https://doi.org/10.1073/pnas.1423947112>)

(* denotes equal contribution)

- Proceedings of Refereed Conferences

- [C1] F. A. Taha, **F. Parise**. “Estimation of Unknown Payoff Parameters in Large Network Games”. *Proceedings of the American Control Conference (ACC)*, 2023.

- [C2] S. Yan, **F. Parise**, E. Bitar. “Data-Driven Approximations of Chance Constrained Programs in Nonstationary Environments”. *Proceedings of the IEEE Conference on Decision and Control (CDC)*, 2022.
- [C3] A. Bhaskar, S. Rangarajan, V. Shree, M. E. Campbell, **F. Parise**. “Accelerated Consensus via DeGroot-Update on Linear Combination of Current and Past States” in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Austin, USA, Dec 2021.
- [C4] L. Cianfanelli, **F. Parise**, D. Acemoglu, G. Como, A. Ozdaglar. “Lockdown interventions in SIR models: Is the reproduction number the right control variable?” in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Austin, USA, Dec 2021.
- [C5] S. Erol, **F. Parise**, A. Teytelboym. “Contagion in Graphons” in *EC ’20: Proceedings of the 2020 ACM Conference on Economics and Computation*, June 2020.
- [C6] E. Meigs, **F. Parise** and A. Ozdaglar . “Learning in Repeated Stochastic Network Aggregative Games”, in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Nice, France, Dec 2019.
- [C7] **F. Parise**, A. Ozdaglar. “Graphon Games.” in *EC ’19: Proceedings of the 2019 ACM Conference on Economics and Computation*, June 2019.
- [C8] D. Paccagnan, **F. Parise** and J. Lygeros. “On the Efficiency of Nash Equilibria in Charging Games”, in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Fontainebleau, Florida, Dec 2018.
- [C9] **F. Parise** and A. Ozdaglar. “Sensitivity analysis for network aggregative games”, in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Melbourne, Australia, Dec 2017.
- [C10] E. Meigs, **F. Parise** and A. Ozdaglar . “Learning dynamics in stochastic routing games”, in *Proceedings of the Allerton Conference*, Allerton, IL, USA, Oct 2017.
- [C11] **F. Parise**, M.E. Valcher and J. Lygeros. “Reachability analysis for switched affine systems and its application to controlled stochastic biochemical reaction networks”, in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Las Vegas, USA, Dec 2016.
- [C12] 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”, in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Las Vegas, USA, Dec 2016.
- [C13] L. Moeller, B. Gentile, **F. Parise**, S. Grammatico and J. Lygeros. “Constrained deterministic leader-follower mean field control”, in *Proceedings of the American Control Conference (ACC)*, Boston, MA, USA, Jul 2016.
- [C14] **F. Parise**, B. Gentile, S. Grammatico and J. Lygeros. “Network aggregative games: Distributed convergence to Nash equilibria”, in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Osaka, Japan, Dec 2015, pp. 2295–2300.
- [C15] **F. Parise**, M.E. Valcher and J. Lygeros. “On the use of hyperplane methods to compute the reachable set of controlled stochastic biochemical reaction networks”, in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Osaka, Japan, Dec 2015, pp. 1259–1264.

- [C16] S. Grammatico, **F. Parise** and J. Lygeros. “Constrained linear quadratic deterministic mean field control: Decentralized convergence to Nash equilibria in large populations of heterogeneous agents”, in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Osaka, Japan, Dec 2015, pp. 4412–4417
- [C17] **F. Parise**, S. Grammatico and J. Lygeros. “On constrained mean field control for large populations of heterogeneous agents: Decentralized convergence to Nash equilibria”, in *Proceedings of the European Control Conference (ECC)*, Linz, Austria, Jun 2015, pp. 3316–3321.
- [C18] S. Grammatico, B. Gentile, **F. Parise**, J. Lygeros. “A mean field control approach for demand side management of large populations of thermostatically controlled loads”, in *Proceedings of the European Control Conference (ECC)*, Linz, Austria, Jun 2015, pp. 3548–3553.
- [C19] **F. Parise**, M. Colombino, S. Grammatico and J. Lygeros. “Mean field constrained charging policy for large populations of plug-in electric vehicles”, in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Los Angeles, CA, USA, Dec 2014, pp. 5101–5106.
- [C20] **F. Parise**, M.E. Valcher and J. Lygeros. “On the reachable set of the controlled gene expression system”, in *Proceedings of the IEEE Conference on Decision and Control (CDC)*, Los Angeles, CA, USA, Dec 2014, pp. 4597–4604.
- [C21] **F. Parise** and G. Picci. “Identification of high tide models in the Venetian lagoon: variable selection and G-LASSO”, in *Proceedings of the IFAC World Congress*, Cape Town, South Africa, Aug 2014, pp. 10385–10390.
- [C22] **F. Parise**, J. Ruess and J. Lygeros. “Grey-box techniques for the identification of a controlled gene expression model”, in *Proceedings of the European Control Conference (ECC)*, Strasbourg, France, Jun 2014, pp. 1498–1503.
- [C23] **F. Parise** and G. Picci. “System identification for tide prediction in the Venetian lagoon”, in *Proceedings of the European Control Conference (ECC)*, Zurich, Switzerland, Jul 2013, pp. 2994–2999.