

John Lygeros

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Automatic Control Laboratory
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Education

University of California, Berkeley
DOCTOR OF PHILOSOPHY
Electrical Engineering and Computer Sciences
May 18, 1996

Imperial College of Science, Technology and Medicine, London, U.K.
MASTERS OF SCIENCE
Control Systems
December 18, 1991

Imperial College of Science, Technology and Medicine, London, U.K.
BACHELORS OF ENGINEERING
Electrical & Electronic Engineering
August 1, 1990

Appointments

July 2015 - present: ETH Zurich
Head, Department of Information Technology and Electrical Engineering

January 2010 - present: ETH Zurich
Professor of Computation and Control

January 2009 - present: ETH Zurich
Head, Automatic Control Laboratory

July 2006 - December 2009: ETH Zurich
Associate Professor, Automatic Control Laboratory

March 2003 - July 2006: University of Patras
Assistant Professor, Department of Electrical and Computer Engineering

July 2000 - June 2003: University of Cambridge
University Lecturer, Department of Engineering

October 2000 - June 2003: Churchill College, Cambridge
Title A Fellow

January 2000 - June 2000: Military service, Hellenic Navy

October 1997 - December 1999: University of California, Berkeley
Postdoctoral Research Associate, Electrical Engineering and Computer Sciences

June 1998 - December 1999: SRI International, Menlo Park, California
Research Engineer (part time), Applied Physical Sciences Laboratory

May 1999 - June 1999: Universite de Bretagne Occidentale, Brest, France
Visiting Professor, Mathematics Department

November 1996 - October 1997: Massachusetts Institute of Technology
Postdoctoral Research Associate, Laboratory for Computer Science

June 1996 - October 1996: University of California, Berkeley
Visiting Postdoctoral Researcher, National Automated Highway System Consortium

January 1993 - May 1996: University of California, Berkeley
Graduate Student Researcher, Electrical Engineering and Computer Sciences

August 1992 - December 1992: University of California, Berkeley
Graduate Student Instructor, Electrical Engineering and Computer Sciences

June 1989 - August 1989: National Power, U.K.
Intern, Central Electricity Research Laboratories

June 1988 - July 1988: Hellenic Aspropyrgos Refinery, Greece
Intern

Honors and Awards

2016: IEEE Control Systems Society George S. Axelby Outstanding Paper Award (with P. Mohajerin Esfahani and T. Sutter)

2016: Credit Suisse Award for Best Teaching, ETH Zurich

2015: Plenary lecture, Cyber-physical Systems Week 2015 (CPS Week 2015)

2014: Golden Owl teaching award, ETH Zurich.

2013: Plenary lecture, Computational Methods in Systems Biology Conference (CMSB2013)

2013: Plenary lectures, BeNeLux Meeting on Systems and Control.

2012: Golden Owl teaching award, ETH Zurich.

2012: Semi-plenary lecture, IEEE Conference on Decision and Control (CDC 2012).

2011: Fellow of the IEEE “for contributions to hybrid and stochastic systems and applications”.

2011: Plenary lecture, Computational Management Science Conference (CMS 2011)

2009: Golden Owl teaching award, ETH Zurich.

2008: Semi-plenary lecture, Chinese Control and Decision Conference (CCDC 2008).

2004: Senior Member of the IEEE.

1997: Eliahu Jury PhD Thesis Award, University of California, Berkeley

1991: California Micro electronics Fellowship, University of California, Berkeley

1991: M.Sc. with Distinction, Imperial College of Science, Technology and Medicine

1990: Science and Engineering Research Council Studentship, London, U.K.

1990: B.Eng. with First Class Honours, Imperial College of Science, Technology and Medicine.

1990: Governors Prize in Electrical Engineering, City and Guilds College, London, U.K.

Ph.D. Supervised to Completion

Ioannis Lymperopoulos, 2010, "Sequential Monte Carlo methods in air traffic management"

Konstantinos Koutroumpas, 2010, "Stochastic Hybrid Systems for DNA replication modeling"

Georgios Chaloulos, 2011, "Optimization-Based Control for Conflict Resolution in Air Traffic Management"

Konstantinos (Kostas) Margellos, 2012, "Constrained Optimal Control for Complex Systems - Analysis and Applications"

Andreas Miliadis-Argeitis, 2013, "Computational methods for simulation, identification and model selection in systems biology"

Sean J. Summers, 2013, "Verification and synthesis of optimal decision strategies for complex systems"

Tomas Tuma, 2013, "The four pillars of nanopositioning for scanning probe microscopy" (with IBM Zurich Research Laboratory)

Peyman Mohajerin-Esfahani, 2014, "Stochastic Motion Planning for Diffusions and Fault Detection and Isolation for Large Scale Nonlinear Systems"

Stephan M. Huck, 2014, "Markov Chain Monte Carlo Methods for Monitoring Applications"

Jacob Ruess, 2014, "Moment-based methods for the analysis and identification of stochastic models of biochemical reaction Networks"

Nikolaos Kariotoglou, 2015, "Optimization-based approximations to stochastic reachability problems"

Tobias Baltensperger, 2015, "Market Power in Natural Gas Markets" (with Department of Environmental Systems Science, ETH Zurich)

Andreas B. Hempel, 2016, "Control of Piecewise Affine Systems Through Inverse Optimisation"

Francesca Parise, 2016, “Inference and control for populations of systems: from aggregative games to systems biology”

Xiaojing (George) Zhang, 2016, “Robust and Stochastic Control of Uncertain Systems: From Scenario Optimization to Adjustable Uncertainty Sets”

Current PhD students

Michaela Bauer (with BMW Group, Munich)

Paul Beuchat

Georgios Darivianakis

Benjamin Flamm

Damian Frick (co-supervised with M. Morari)

Basilio Gentile

Marc Hohmann (with Empa)

Angeliki Kamoutsi

Alexander Liniger

Fabian Müller (with IBM Zurich Research Laboratory)

Dario Paccagnan

Felix Rey

Marius Schmitt

Tobias Sutter

Former Postdoctoral Research Associates

Manuela L. Bujorianu (while at University of Cambridge)

Alberto Busetto

Eugenio Cinquemani

Debashish Chatterjee

Eva Cruck

Badis Djeridane

Gao Yann (while at University of Cambridge)

Angelos Georghiou

Sergio Grammatico

Peter Hokayem (ETH Zurich Senior Scientist)
Maryam Kamgarpour
Ioannis Kitsios (while at University of Patras)
Andrea Lecchini (while at University of Cambridge)
Riccardo Porreca
Federico Ramponi
Tyler Summers (ETH Fellow)
Chenggui Yuan (while at University of Cambridge)

Current Postdoctoral Research Associates

Annika Eichler
Nikolaos Kariotoglou
Chitrhupa Ramesh
Joseph Warrington (ETH Zurich Senior Scientist)

Active Research Grants

Principal Investigator, *Integration of Sustainable Mutli Energy Hub Systems (IMES)*, Swiss National Science Foundation, NFP 407040.154028, start date September 1, 2014.

Principal Investigator, *SCCER Future Energy Efficient Buildings & Districts (FEEB&D)*, Swiss Competence Centre for Energy Research, start date June 1, 2014.

Principal Investigator, *Model-driven experimental design towards a model of TOR signaling (SignalX)*, SystemsX, 2013/156, April 1, 2014.

Principal Investigator, *Scalable Proactive Event Driven Decision Making (SPEEDD)*, European Commission, Information Communication Technologies (ICT), FP7, Specific Targeted Research Project (STREP), FP7-ICT-619435, start date February 1, 2014.

Principal Investigator, *System of Systems that Act Locally for Optimizing Globally (Local4Global)*, European Commission, Information Communication Technologies (ICT), FP7, Specific Targeted Research Project (STREP), FP7-ICT-611538, start date October 1, 2013.

Principal Investigator, *Demand Response for Ancillary Services: Thermal Storage Control (HeatReserves)*, Nano-Tera.ch, 20NA21_145915, start date April 1, 2013.

Completed Research Grants

Principal Investigator, *Behavioural and technical optimisation for building energy efficiency and flexibility*, ETH Zurich Foundation Seed Project number 2015-07(6), January 1 to December 31, 2016.

Principal Investigator, *Dynamic Management of Physically Coupled Systems of Systems (DYMASOS)*, European Commission, Information Communication Technologies (ICT), FP7, Specific Targeted Research Project (STREP), FP7-ICT-611281, October 1, 2013 to September 30, 2016..

Principal Investigator, *Approximate Dynamic Programming for Stochastic Hybrid Systems: Linear Programming and Multi-Objective Optimization*, ETH Zurich, grant number ETH 15 12-2, February 1, 2013 to January 31, 2016.

Principal Investigator, *Development of New PhD Courses and Increase of Research Potential in the Field of Automation of Processes in Air Transport and Traffic Systems*, Swiss National Science Foundation, Institutional Partnerships (SCOPES), IZ74Z0-137352, October 1, 2011 to March 31, 2015.

Principal Investigator, *Feedback control of camera networks for tracking and surveillance*, Swiss National Science Foundation, grant number 200021-137876, January 1, 2012 to December 31, 2014.

Principal Investigator, *KIOS Research Center for Intelligent Systems and Networks*, Research Promotion Foundation of Cyprus, September 1, 2010 to December 31, 2014.

Principal Investigator, *Highly-complex and networked control systems (HYCON2)*, European Commission, Information Communication Technologies (ICT), FP7, Network of Excellence (NoE), FP7-ICT-257462, September 1, 2010 to November 30, 2014.

Principal Investigator, *Hierarchical Control for Renewable Wind Energy Generation*, Staatssekretariat für Bildung und Forschung (SBF), April 1, 2011 to March 31, 2014.

Coordinator and Principal Investigator, *Modeling, verification and control of complex systems: From foundations to power network applications (MoVeS)*, European Commission, Information Communication Technologies (ICT), FP7, Specific Targeted Research Project (STREP), FP7-ICT-257005, October 1, 2010 to September 30, 2013.

Principal Investigator, *Towards an understanding of nutrient signaling and metabolic operation (YeastX)*, SystemsX, August 1, 2008 to July 31, 2013.

Principal Investigator, *Intelligent Monitoring, Control, and Security of Critical Infrastructure systems (IntelliCIS)*, European Science Foundation COST Action, grant number IC-0806, May 11, 2009 to May 10, 2013.

Principal Investigator, *Real time computation and optimization for networked camera surveillance*, Nano-Tera/SSSTC Pilot Grant, October 1, 2011 to September 30, 2012.

Principal Investigator, *Stochastic MPC*, ETH Zurich, grant number ETH 12 09-2, August 1, 2009 to July 31, 2012.

Principal Investigator, *Stochastic Model Predictive Control*, Swiss National Science Foundation, grant number 200021-122072, December 1, 2008 to January 31, 2012.

Principal Investigator, *Feedback design for wireless networked systems (FeedNetBack)*, European Commission, Information Communication Technologies (ICT), FP7, Specific Targeted Research Project (STREP), FP7-ICT-223866, September 15, 2008 to January 15, 2012.

Principal Investigator, *Vital Infrastructure, Networks, Information and Control Systems Management (VIKING)*, European Commission, Information Communication Technologies (ICT) and Security (SEC), FP7, Specific Targeted Research Project (STREP), FP7-ICT-SEC-225643, November 1, 2008 to November 30, 2011.

Principal Investigator, *Analysis and Control of Hybrid Systems*, Sino-Swiss Science and Technology Cooperation Program (SSSCT), Travel Grant EG 50-032010, September 1 to October 31, 2011.

Principal Investigator, *Safety, Complexity and Responsibility based design and validation of highly automated Air Traffic Management (iFly)*, European Commission, Energy and Transport (TREN), FP6, Specific Targeted Research Project (STREP), FP6-TREN-03710, May 22, 2007 to August 22, 2011.

Principal Investigator, *Contract-based Air Transportation System (CATS)*, European Commission, Energy and Transport (TREN), FP7, Specific Targeted Research Project (STREP), FP7-TREN-036889, November 1, 2007 to November 30, 2010.

Principal Investigator, *En-route air traffic soft management ultimate system (ERASMUS)*, European Commission, Energy and Transport (TREN), FP6, Specific Targeted Research Project (STREP), FP6-TREN-518276, May 5, 2006 to February 23, 2009.

Coordinator and Principal Investigator, *Hybrid systems for biochemical network modeling and analysis (HYGEIA)*, European Commission, New and Emerging Science and Technology (NEST), FP6, Specific Targeted Research Project (STREP), FP6-NEST-4995, January 1, 2005 to December 31, 2007.

Principal Investigator, *Taming heterogeneity and complexity of networked embedded systems, (HYCON)*, European Commission, Information Society Technologies (IST), FP6, Network of Excellence, FP6-IST-511368, September 15, 2004 to September 14, 2008.

Principal Investigator, *Reconfigurable, ubiquitous networked embedded systems, (RUNES)*, European Commission, Information Society Technologies (IST), FP6, Integrated Project, FP6-IST-004536, September 1, 2004 to July 31, 2007.

Principal Investigator, *Towards a next generation ATM system: Model based conflict detection and resolution*, Eurocontrol Experimental Centre, grant C20051E/BM/03, July 1, 2003 to June 30, 2006.

Coordinator and Principal Investigator, *Controller design for safety critical embedded systems, (COLUMBUS)*, European Commission, Information Society Technologies (IST), FP5, research contract, FP5-IST-2001-38314, July 1, 2002 to June 30, 2004.

Principal Investigator, *Stochastic hybrid systems in air traffic management*, The British Council and the Netherlands Organization for Scientific Research. U.K.-Netherlands Partnership Program in Science, grant PPS718, April 11, 2002.

Principal Investigator, *Probabilistic collision avoidance for air traffic control*, Engineering and Physical Sciences Research Council, U.K. Visiting Fellowship GR/R62663/01, March 27, 2002.

Principal Investigator, *Simulation and design of hybrid control systems*, Engineering and Physical Sciences Research Council, U.K. CASE Studentship, October 1, 2001 to September 30, 2004.

Principal Investigator, *Distributed control and stochastic analysis of hybrid systems, supporting safety critical real-time systems design (HYBRIDGE)*, European Commission, Information Society Technologies (IST), FP5, research contract, FP5-IST-2001-32460, January 1, 2002 to March 31, 2005.

Principal Investigator, *Toward a viability theory for hybrid systems*, Engineering and Physical Sciences Research Council, U.K., research grant GR/R51575/01, March 1, 2002 to June 30, 2003.

Professional Activities and Service

Fellow of the IEEE. Member of the IET and the Technical Chamber of Greece.

Member of the IEEE Control Systems Society Board of Governors, 2012 to 2015.

Treasurer and Member of Council, International Federation of Automatic Control (IFAC), 2013 to date.

Member of the Scientific Steering Committee of the Newton Institute, Cambridge U.K., 2012 to 2015.

Member of the ETH Zurich Research Commission, 2012 to 2014.

Associate editor of the IEEE Transactions on Automatic Control, 2006 to 2009.

Guest Editor for Nonlinear Analysis: Hybrid Systems, special issue on “Hybrid Systems: Computation and Control”, 2017. Guest editor for the European Journal of Control, special issue on “Stochastic Hybrid Systems”, December 2010. Guest editor for the International Journal of Adaptive Control and Signal Processing, special issue on “Air Traffic Management: Challenges and opportunities for advanced control”, October 2010.

Program Co-Chair (with M. Fränzle), *International Conference on Hybrid Systems: Computation and Control 2014* (HSCC 2014).

International Program Committee Chair, *European Control Conference 2013* (ECC13).

Technical Program Committee Co-Chair (with B. Sinopoli), *IFAC Workshop on Estimation and Control of Networked Systems 2010* (NecSys2010).

Member of the IEEE Control Systems Society Conference Editorial Board, 1997 to 1999.

Member of the Program Committee of the 5th *International Conference on Hybrid Systems* (HS97), the International Workshop *Hybrid Systems: Computation and Control* (HSCC), 1999-2005, 2008, 2010, and 2015 the *American Control Conference* (ACC) 2005 and 2007, the *International Conference on Research in Air Transportation* (ICRAT) 2004-2010, the IEEE international conference on *Research Innovation and Vision for the Future* (RIVF) 2006 and 2007, the *Conference on Computer Aided Verification* (CAV) 2007, the *Control over Communication Channels* workshop (ConCom) 2007, the *International Conference on Robot Communication and Coordination* (RoboComm) 2007, the *US/EUROPE Air Traffic Management Research and Development Seminar* (ATM R&D) 2009, EUROCONTROL's *Innovation Workshop* (INO) 2010, and the *IEEE Mediterranean Conference on Control and Automation* (MED) 2011.

Member of the International Program Committee of the 2nd IFAC conference on the *Analysis and Design of Hybrid Systems (ADHS)* 2006, the IFAC *Symposium on Automatic Control in Aerospace (SACA)* 2007, and the *International Symposium on Mathematical Theory of Networks and Systems (MTNS)* 2010.

Co-organizer (with G.J. Pappas and S.S. Sastry) of the workshop “Hybrid Systems: Modeling, analysis, control”, IEEE Conference on Decision and Control, December 6, 1999, Phoenix, Arizona, U.S.A.. Organizer of the workshop “Stochastic hybrid systems: Theory and application to air traffic management”, University of Cambridge, September 5, 2003, Cambridge, U.K.. Co-organizer (with K. Kyriakopoulos and M.D. di Benedetto) of the workshop “Hybrid systems: A formal paradigm for safety critical embedded systems”, University of Patras, September 22-24, 2004, Rio, Patras, Greece. Co-organizer (with A. van der Schaft) of the workshop “Stochastic hybrid systems: Theory and applications” IEEE Conference on Decision and Control, December 13, 2004, Paradise Island, The Bahamas. Co-organizer (with G. Ferrari-Trecate) of the workshop “Hybrid Systems Biology”, IEEE Conference on Decision and Control, December 12, 2006, San Diego, CA, U.S.A. and of the PhD School by the same name, July 20, 2007, Siena, Italy. Co-organizer (with A. Abate and S. Sastry) of the workshop “Stochastic Hybrid Systems: Theory and Applications”, IEEE Conference on Decision and Control, December 8, 2008, Cancun, Mexico. Co-organizer (with M. Khamash and J. Stelling) of the workshop “Stochastic Systems Biology”, Centro Stefano Franscini, Mote Verita, Switzerland, July 19-23, 2011.

Reviewer for (among others) Molecular Systems Biology, SIAM Journal of Control and Optimization, International Journal of Control, Automatica, Systems Control Letters, IEEE Transactions on Automatic Control, IEEE Transactions on Robotics, Proceedings of the IEEE, IEEE Transactions on Control Systems Technology, IEEE Transaction on Vehicular Technology, IEEE Transactions on Fuzzy Systems, Journal of Control Theory and Advanced Technology, Society of Automotive Engineering Journal, Transportation Research C, IEEE Transactions on Aerospace and Electronic Systems IEEE/ACM Transactions on Computational Biology and Bioinformatics, ACM Transactions on Software Engineering and Methodology, IEEE Conference on Decision and Control (CDC), ASME American Control Conference (ACC), EUCA European Control Conference (ECC) and the IFAC World Congress.

Reviewer for AMS Mathematical Reviews 2005-2009.

Member of the international evaluation panel *Heraclitus II*, Secretariat General for Research and Technology (GGET), Greece, 2010. Member of the evaluation panel *Scientific Co-operation between Eastern Europe and Switzerland* (SCOPES, Swiss National Science Foundation, Switzerland), 2009. Member of the *Engineering Responsive Mode Panel*, Engineering and Physical Sciences Research Council (EPSRC, U.K.), 2001.

Evaluator of proposals for the Engineering and Physical Sciences Research Council (EPSRC), the Netherlands Organization for Scientific Research (NWO), the Australian Research Council (ARC), the Greek Secretariat General for Research and Technology (GGET), the Swiss National Science Foundation (SNF), and the Sino-Swiss Science and Technology Cooperation (SSSTC).

Language Skills

Mother Language: Greek

Second Language: English

Other Languages: German, French

List of Publications

John Lygeros

1 Thesis

- 1.1. J. Lygeros, *Hierarchical Hybrid Control of Large Scale Systems*. PhD thesis, Department of Electrical Engineering, University of California, Berkeley, 1996.
- 1.2. J. Lygeros, “Nonlinear feedback control of an absorption/stripping pilot plant,” Master’s thesis, Imperial College of Science Technology and Medicine, University of London, 1991.

2 Patents

- 2.1. T. Tuma, J. Lygeros, A. Pantazi, and A. Sebastian, “Evaluating and optimizing a trajectory function,” Patent Application Number GB1201593.9 2012.
- 2.2. T. Wood, M. Kamgarpour, S. Summers, and J. Lygeros, “Support to emergency evacuation,” Patent Application Number EP 13005725.0 2013.
- 2.3. P. Mohajerin Esfahani, M. Vrakopoulou, J. Lygeros, and G. Andersson, “Intrusion detection in electric power networks,” EP 2690511 (January 29, 2014), WO 2014/015970 (January 30, 2014).
- 2.4. G. Fourlas and J. Lygeros, “Method for the detection of the deviation of civil aircraft from their flight plan,” OBI 1006243, January 23, 2009. International classification: G08G 5/00.

3 Edited Volumes

- 3.1. M. Prandini and J. Lygeros, “Stochastic hybrid systems: A powerful framework for complex, large scale applications,” *European Journal of Control*, vol. 16, pp. 583–594, December 2010.
- 3.2. A. Lecchini Visintini and J. Lygeros, “Air traffic management: challenges and opportunities for advanced control,” *International Journal of Adaptive Control and Signal Processing*, vol. 24, pp. 811–812, October 2010.
- 3.3. C. Cassandras and J. Lygeros (Eds.), *Stochastic Hybrid Systems*. No. 24 in Control Engineering, Boca Raton: CRC Press, 2006.
- 3.4. H. Blom and J. Lygeros (Eds.), *Stochastic Hybrid Systems: Theory and Safety Critical Applications*. No. 337 in Lecture Notes in Control and Information Sciences, Berlin: Springer-Verlag, 2006.

4 Journal Publications

- 4.1. M. Kamgarpour, T. Wood, S. Summers, and J. Lygeros, “Control synthesis for stochastic systems given automata specifications defined by stochastic sets,” *Automatica*, vol. 76, pp. 177–182, February 2017.
- 4.2. X. Zhang, M. Kamgarpour, A. Georghiou, P. Goulart, and J. Lygeros, “Robust optimal control with adjustable uncertainty sets,” *Automatica*, vol. 75, pp. 249–259, January 2017.
- 4.3. S. Grammatico, F. Parise, M. Colombino, and J. Lygeros, “Decentralized convergence to Nash equilibria in constrained deterministic mean field control,” *IEEE Transactions on Automatic Control*, vol. 61, pp. 3315–3329, November 2016.
- 4.4. N. Kariotoglou, K. Margellos, and J. Lygeros, “On the computational complexity and generalization properties of multi-stage and stage-wise coupled scenario programs,” *Systems & Control Letters*, vol. 94, pp. 63–69, August 2016.

- 4.5. P. Mohajerin Esfahani, D. Chatterjee, and J. Lygeros, "The stochastic reach-avoid problem and set characterization for diffusions," *Automatica*, vol. 70, pp. 43–56, August 2016.
- 4.6. P. Mohajerin Esfahani, D. Chatterjee, and J. Lygeros, "Motion planning for continuous time stochastic processes: A dynamic programming approach," *IEEE Transactions on Automatic Control*, vol. 61, pp. 2155–2170, August 2016.
- 4.7. M. Soler, M. Kamgarpour, J. Lloret, and J. Lygeros, "A hybrid optimal control approach to fuel efficient aircraft conflict avoidance," *IEEE Transactions on Intelligent Transportation Systems*, vol. 17, pp. 1826–1838, July 2016.
- 4.8. T. Baltensperger, R. Fuchsli, P. Krütli, and J. Lygeros, "Multiplicity of equilibria in conjectural variations models of natural gas markets," *European Journal of Operational Research*, vol. 252, pp. 646–656, July 2016.
- 4.9. T. Sutter and J. Lygeros, "Signals and systems II: A flipped classroom experiment in undergraduate control education," *ASME Control and Dynamics Magazine*, pp. 17–21, June 2016.
- 4.10. M.W.-D.Müller, M. Österreich, A. M. 1, and J. Lygeros, "Assessment of the brain's macro- and micro-circulatory blood flow responses to CO_2 via transfer function analysis," *Frontiers in Physiology*, vol. 7, article 162 pp. 1–7, May 2016.
- 4.11. T. Summers, F. Cortesi, and J. Lygeros, "On submodularity and controllability in complex dynamical networks," *IEEE Transactions on Control of Network Systems*, vol. 3, pp. 91–101, March 2016.
- 4.12. A. Miliadis-Argeitis, A. P. Oliveira, L. Gerosa, L. Falter, U. Sauer, and J. Lygeros, "Elucidation of genetic interactions in the yeast GATA-factor network using Bayesian model selection," *PLOS Computational Biology*, 10.1371/journal.pcbi.1004784, March 11, 2016.
- 4.13. P. Mohajerin Esfahani and J. Lygeros, "A tractable fault detection and isolation approach for nonlinear systems with probabilistic performance," *IEEE Transactions on Automatic Control*, vol. 61, pp. 633–647, March 2016.
- 4.14. S. Grammatico, X. Zhang, K. Margellos, P. Goulart, and J. Lygeros, "A scenario approach for non-convex control design," *IEEE Transactions on Automatic Control*, vol. 61, pp. 334–345, February 2016.
- 4.15. X. Zhang, S. Grammatico, G. Schildbach, P. Goulart, and J. Lygeros, "On the sample size of random convex programs with structured dependence on the uncertainty," *Automatica*, vol. 60, pp. 182–188, October 2015.
- 4.16. K. Margellos, M. Prandini, and J. Lygeros, "On the connection between compression learning and scenario based single-stage and cascading optimization problems," *IEEE Transactions on Automatic Control*, vol. 60, pp. 2716–2721, October 2015.
- 4.17. T. Summers, J. Warrington, M. Morari, and J. Lygeros, "Stochastic optimal power flow based on conditional value at risk and distributional robustness," *Electrical Power and Energy Systems*, vol. 72, pp. 116–125, November 2015.
- 4.18. J. Ruess, F. Parise, A. Miliadis-Argeitis, M. Khammash, and J. Lygeros, "Iterative experiment design guides the characterization of a light-inducible gene expression circuit," *Proceedings of the National Academy of Sciences of the U.S.A.*, vol. 112, pp. 8148 – 8153, June 2015.
- 4.19. F. Parise, J. Lygeros, and J. Ruess, "Bayesian inference for stochastic individual-based models of ecological systems: a pest control simulation study," *Frontiers in Environmental Science*, vol. 3, pp. 1–12, June 2015.
- 4.20. A. Hempel, P. Goulart, and J. Lygeros, "Inverse parametric optimization with an application to hybrid system control," *IEEE Transactions on Automatic Control*, vol. 60, pp. 1064–1069, April 2015.
- 4.21. T. Sutter, D. Sutter, P. Mohajerin Esfahani, and J. Lygeros, "Efficient approximation of channel capacities," *IEEE Transactions on Information Theory*, vol. 61, pp. 1649–1666, April 2015.
- 4.22. J. Mathieu, M. Kamgarpour, J. Lygeros, G. Andersson, and D. Callaway, "Arbitraging intraday wholesale energy market prices with aggregations of thermostatic loads," *IEEE Transactions on Power Systems*, vol. 30, pp. 763–772, March 2015.

- 4.23. S. Engell, J. Lygeros, and S. Grammatico, "The emergence of systems of systems," *Pan European Networks Science and Technology*, pp. 79–81, March 2015.
- 4.24. J. Ruess and J. Lygeros, "Moment-based methods for parameter inference and experiment design for biochemical reaction networks," *ACM Transactions on Modeling and Computer Simulation*, vol. 25, pp. 8:1–8:25, February 2015.
- 4.25. M. Rapsomaniki, E. Cinquemani, N. Giakoumakis, P. Kotsantis, J. Lygeros, and Z. Lygerou, "Inference of protein kinetics by stochastic modeling and simulation of fluorescence recovery after photobleaching experiments," *Bioinformatics*, vol. 31, no. 3, pp. 355–362, 2015.
- 4.26. D. Chatterjee and J. Lygeros, "On stability and performance of stochastic predictive control techniques," *IEEE Transactions on Automatic Control*, vol. 60, pp. 509–514, February 2015.
- 4.27. P. Mohajerin Esfahani, T. Sutter, and J. Lygeros, "Performance bounds for the scenario approach and an extension to a class of non-convex programs," *IEEE Transactions on Automatic Control*, vol. 60, pp. 46–58, January 2015.
- 4.28. M. Zamani, P. Mohajerin Esfahani, R. Majumdar, A. Abate, and J. Lygeros, "Symbolic control of stochastic systems via approximately bisimilar finite abstractions," *IEEE Transactions on Automatic Control*, vol. 59, no. 12, pp. 3135–3150, December 2014.
- 4.29. A. Artikis, C. Baber, P. Bizarro, C. Canudas-de-Wit, O. Etzion, F. Fournier, P. Goulart, A. Howes, J. Lygeros, G. Paliouras, A. Schuster, and I. Sharfman, "Scalable proactive event-driven decision making," *IEEE Technology and Society Magazine*, vol. 33, no. 3, pp. 35–41, Fall 2014.
- 4.30. A. Miliadis-Argeitis, J. Lygeros, and M. Khammash, "Steady-state simulation of metastable stochastic chemical systems," *Journal of Chemical Physics*, vol. 141, no. 024104, 2014.
- 4.31. N. Kariotoglou, D. Raimondo, S. Summers, and J. Lygeros, "Multi-agent autonomous surveillance: A framework based on stochastic reachability and hierarchical task allocation," in *ASME Journal of Dynamic Systems, Measurement, and Control*, vol. 137, no. 3, October 2014.
- 4.32. K. Margellos, P. Goulart, and J. Lygeros, "On the road between robust optimization and the scenario approach for chance constrained optimization problems," *IEEE Transactions on Automatic Control*, vol. 59, pp. 2258–2264, August 2014.
- 4.33. T. Tuma, W. Haeberle, H. Rothuizen, J. Lygeros, A. Pantazi, and A. Sebastian, "Dual-stage nanopositioning for high-speed scanning probe microscopy," *IEEE/ASME Transactions on Mechatronics*, vol. 19, pp. 1035 – 1045, June 2014.
- 4.34. T. Tuma, A. Sebastian, J. Lygeros, and A. Pantazi, "The four pillars of nanopositioning for scanning probe microscopy," *Control Systems Magazine*, vol. 33, pp. 68–85, December 2013.
- 4.35. M. Vrakopoulou, K. Margellos, J. Lygeros, and G. Andersson, "A probabilistic framework for reserve scheduling and N-1 security assessment of systems with high wind power penetration," *IEEE Transactions on Power Systems*, vol. 28, pp. 3885–3896, November 2013.
- 4.36. K. Margellos and J. Lygeros, "Viable set computation for hybrid systems," *Nonlinear Analysis: Hybrid Systems*, vol. 10, pp. 45–62, November 2013.
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6 Conference Publications

- 6.1. F. Rey, D. Frick, A. Domahidi, J. Jerez, M. Morari, and J. Lygeros, “ADMM prescaling for model predictive control,” in *IEEE Conference on Decision and Control*, Las Vegas, NV, USA, December 12-14, 2016.
- 6.2. B. Gentile, D. Paccagnan, F. Parise, M. Kamgarpour, and J. Lygeros, “Distributed computation of generalized nash equilibria in quadratic aggregative games with affine coupling constraints,” in *IEEE Conference on Decision and Control*, Las Vegas, NV, USA, December 12-14, 2016.
- 6.3. F. Parise, M. Valcher, and J. Lygeros, “Reachability analysis for switched affine systems and its application to controlled stochastic biochemical reaction networks,” in *IEEE Conference on Decision and Control*, Las Vegas, NV, USA, December 12-14, 2016.
- 6.4. B. Gentile, F. F. Parise, D. Paccagnan, M. Kamgarpour, and J. Lygeros, “Distributed computation of generalized nash equilibria in aggregative games with coupling constraints,” in *17th International Symposium on Dynamic Games and Applications*, Urbino, Italy, July 12–15, 2016.
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- 6.6. D. Paccagnan, M. Kamgarpour, and J. Lygeros, “On aggregative and mean field games with applications to electricity markets,” in *European Control Conference*, Aalborg, Denmark, June 29 - July 1, 2016.
- 6.7. C. Ramesh, M. Schmitt, and J. Lygeros, “Distributed learning in the presence of disturbances,” in *European Control Conference*, Aalborg, Denmark, June 29 - July 1, 2016.
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- 6.13. A.B. Hempel, P.J. Goulart, and J. Lygeros, “A Necessary Optimality Condition for Constrained Optimal Control of Hybrid Systems,” in *IEEE Conference on Decision and Control*, Osaka, Japan, December 15-18, 2015.
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- 6.15. G. Darivianakis, A. Georghiou, R. Smith, and J. Lygeros, “A stochastic optimization approach to cooperative building energy management via an energy hub,” in *IEEE Conference on Decision and Control*, Osaka, Japan, December 15-18, 2015.
- 6.16. D. Paccagnan, M. Kamgarpour, and J. Lygeros, “On the range of feasible power trajectories for a population of thermostatically controlled loads,” in *IEEE Conference on Decision and Control*, Osaka, Japan, December 15-18, 2015.
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- 6.21. J. Lygeros, Margellos, and M. Prandini, "Compression learning for chance constrained stochastic MPC," in *5th IFAC Conference on Nonlinear Model Predictive Control (NMPC'15)*, Seville, Spain, September 17-20, 2015.
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- 6.28. B. Gentile, S. Grammatico, and J. Lygeros, "Mean field modeling of large-scale energy systems," in *Vienna International Conference on Mathematical Modelling*, Vienna, Austria, February 18-20, 2015.
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- 6.38. S. Huck, N. Kariotoglou, M. Dahinden, and J. Lygeros, "Experimental validation of patrolling strategies in an automated surveillance environment," in *IFAC World Congress*, Cape Town, South Africa, August 24-29, 2014.
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- 6.40. T. Summers, J. Warrington, M. Morari, and J. Lygeros, "Stochastic optimal power flow based on convex approximations of chance constraints," in *Power Systems Computation Conference (PSCC)*, (Wroclaw, Poland), August 18-22 2014.
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- 6.50. M. Soler, M. Kamgarpour, and J. Lygeros, "A numerical framework and benchmark case study for multi-modal fuel efficient aircraft conflict avoidance," in *International Conference on Research in Air Transportation (ICRAT)*, Istanbul Turkey, May 26-30, 2014.
- 6.51. M. Zamani, P. Mohajerin Esfahani, R. Majumdar, A. Abate, and J. Lygeros, "Bisimilar finite abstractions of stochastic control systems," in *IEEE Conference on Decision and Control*, Florence, Italy, December 10-13, 2013.

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- 6.53. P. Hokayem, D. Chatterjee, and J. Lygeros, "Chance-constrained lqg with bounded control policies," in *IEEE Conference on Decision and Control*, Florence, Italy, December 10-13, 2013.
- 6.54. J. Ruess and J. Lygeros, "Identifying stochastic biochemical networks from single-cell population experiments: a comparison of approaches based on the fisher information," in *IEEE Conference on Decision and Control*, Florence, Italy, December 10-13, 2013.
- 6.55. X. Zhang, K. Margellos, P. Goulart, and J. Lygeros, "Stochastic model predictive control using a combination of randomized and robust optimization," in *IEEE Conference on Decision and Control*, Florence, Italy, December 10-13, 2013.
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- 6.57. E. Tiniou, P. Mohajerin Esfahani, and J. Lygeros, "Fault detection with discrete-time measurements: An application for the cyber security of power networks," in *IEEE Conference on Decision and Control*, Florence, Italy, December 10-13, 2013.
- 6.58. V. Rostampour, K. Margellos, M. Vrakopoulou, M. Prandini, G. Andersson, and J. Lygeros, "Reserve requirements in AC power systems with uncertain generation," in *IEEE PES Innovative Smart Grid Technologies Europe*, Lyngby, Denmark, October 6-9, 2013.
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- 6.61. J. Mathieu, M. Kamgarpour, J. Lygeros, and D. Callaway, "Energy arbitrage with thermostatically controlled loads," in *European Control Conference*, Zurich, Switzerland, July 17-19, 2013.
- 6.62. K. Margellos, V. Rostampour, M. Vrakopoulou, M. Prandini, G. Andersson, and J. Lygeros, "Stochastic unit commitment and reserve scheduling: A tractable formulation with probabilistic certificates," in *European Control Conference*, Zurich, Switzerland, July 17-19, 2013.
- 6.63. C. Wiltsche, F. Ramponi, and J. Lygeros, "Synthesis of an asynchronous communication protocol for search and rescue robots," in *European Control Conference*, Zurich, Switzerland, July 17-19, 2013.
- 6.64. S. Huck and Lygeros, "Stochastic localization of sources with convergence guarantees," in *European Control Conference*, Zurich, Switzerland, July 17-19, 2013.
- 6.65. N. Kariotoglou, S. Summers, T. Summers, M. Kamgarpour, and J. Lygeros, "Approximate dynamic programming for stochastic reachability," in *European Control Conference*, Zurich, Switzerland, July 17-19, 2013.
- 6.66. T. Summers, K. Kunz, N. Kariotoglou, M. Kamgarpour, S. Summers, and J. Lygeros, "Approximate dynamic programming via sum of squares programming," in *European Control Conference*, Zurich, Switzerland, July 17-19, 2013.
- 6.67. M. Vrakopoulou, M. Katsampani, K. Margellos, J. Lygeros, and G. Andersson, "Probabilistic security-constrained ac optimal power flow," in *PowerTech*, Grenoble, France, June 16-20, 2013.
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- 6.69. B. Svetozarevic, P. Mohajerin Esfahani, M. Kamgarpour, and J. Lygeros, "A robust fault detection and isolation filter for a horizontal axis variable speed wind turbine," in *American Control Conference*, Washington, DC, U.S.A., June 17-19, 2013.

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- 6.77. G. Andersson, P. Mohajerin Esfahani, M. Vrakopoulou, K. Margellos, J. Lygeros, A. Teixeira, G. Dan, H. Sandberg, and K. Johansson, "Cyber-security of SCADA systems," in *Innovative Smart Grid Technologies (ISGT IEEE PES)*, Berlin, Germany, October 14-17, 2012.
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- 6.80. A. Hempel, P. Goulart, and J. Lygeros, "Inverse parametric quadratic programming and an application to hybrid control," in *IFAC Nonlinear Model Predictive Control Conference (NMPC '12)*, Noordwijkerhout, The Netherlands, August 23 - 27, 2012.
- 6.81. N. Shamsudhin, H. Rothuizen, M. Despont, J. Lygeros, and A. Sebastian, "Micro-cantilever design and modeling framework for quantitative multi-frequency AFM," in *IEEE International Conference on Nanotechnology (NANO2012)*, Birmingham, UK, August 20-23, 2012.
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- 6.90. N. Kariotoglou, D. Raimondo, S. Summers, and J. Lygeros, "A stochastic reachability framework for autonomous surveillance with pan-tilt-zoom cameras," in *IEEE Conference on Decision and Control*, Orlando, FL, USA, December 12-15, 2011.
- 6.91. N. Kariotoglou, D. Raimondo, S. Summers, and J. Lygeros, "Probabilistic certification of pan-tilt-zoom camera surveillance systems," in *IEEE Conference on Decision and Control*, Orlando, FL, USA, December 12-15, 2011.
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- 6.98. G. Chaloulos, P. Hokayem, and J. Lygeros, "Hierarchical MPC with priorities for conflict resolution in air traffic control," in *IFAC World Congress*, Milan, Italy, August 28 - September 2, 2011.
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