

Luca Furieri - Curriculum Vitae

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date of birth 11 October 1992
nationality Italian

CURRENT POSITION	PhD researcher and teaching assistant , in control theory (ETH Zurich , Automatic Control Laboratory, Switzerland) Advisor: Professor Maryam Kamgarpour	From: Nov, 2016 To: Sep, 2020
EDUCATION	Master's degree in automation engineering (University of Bologna, Italy) Thesis: <i>A new guidance law for fixed-wing UAVs in arbitrarily strong wind fields</i> Grade: 110/110 with honors, 29.80/30 average grade, top 1%	From: Oct, 2014 To: Oct 2016
	Excellence curriculum , Collegio Superiore (University of Bologna, Italy) Admission through national competition in 2011 (5% acceptance rate)	From: Oct, 2011 To: Oct 2016
	Bachelor's degree in automation engineering (University of Bologna, Italy) Thesis: <i>Trajectory planning for Swarms of Quadrotors</i> Grade: 110/110 with honors, 29.27/30 average grade	From: Oct, 2011 To: Oct 2014
RESEARCH INTERESTS	My present research interests focus on developing control policies for complex, multi-agent dynamical systems, when only limited information is available. Specifically, I develop the theory for tractable, learning-based computation of distributed optimal controllers. I am particularly interested in the application of the methods I develop to several physical domains, ranging from smart grid systems to coordinating platoons of autonomous vehicles.	
AWARDED PUBLICATIONS	O. Hugo Schuck Best Paper Award , awarded for the paper “Gone With The Wind: Nonlinear Guidance For Small Fixed-wing Aircraft in Arbitrarily Strong Windfields”, as the best application paper presented at the 2017 American Control Conference (ACC17) [link], [News snippet]	Jun 2018
	Best Student Paper Award @ ECC19 , finalist awarded for the paper “On Separable Quadratic Lyapunov Functions for Convex Design of Distributed Controllers” presented at the 2019 European Control Conference (ECC19), as one of the best 5 student papers among 700+ accepted papers, [link]	Jun 2019
PATENTS	Apparatus for processing horticultural products International application number PCT/IB2017/050405	Jan 2016
COMPUTER SKILLS	MATLAB & Simulink : 5+ years experience developing complex control systems C/C++ and Python YALMIP & ACADO optimization toolboxes Others : basic experience with: HIL (hardware-in-the-loop) simulations with Pixhawk/PX4, OpenCV	

TEACHING & SUPERVISION

Linear Systems Theory (ETH, M.Sc. level course)
Control Systems II (ETH, M.Sc. level course)
Advanced Topics in Control (ETH, M.Sc. level course)

Autumns 2017, 2018, 2019
Spring 2019
Springs 2017, 2018

Luca Varano, semester thesis supervision
Distributed Control for Platooning of Autonomous Vehicles

Oct 2019 - Jan 2020

REVIEW ACTIVITIES

IEEE Transactions on Automatic Control (TAC)
Nonlinear Analysis: Hybrid Systems (NAHS), Elsevier Journal
IEEE Conference on Decision and Control (CDC)
American Control Conference (ACC)
ACM International Conference on Hybrid Systems: Computation and Control (HSCC)

TALKS

An Input-Output Parametrization of Stabilizing Controllers: amidst Youla and System Level Synthesis,
Dec 2019
Presentation of the paper [J2] in Nice, IEEE Conference on Decision and Control

On separable quadratic Lyapunov functions for convex design of distributed controllers,
Jun 2019
Presentation of the paper [C7] in Naples, European Control Conference

Robust distributed control beyond quadratic invariance,
Dec 2018
Presentation of the paper [C6] in Miami, IEEE Conference on Decision and Control

Convexity and performance bounds in synthesizing distributed controllers
Aug 2018
Invited talk at the Department of Engineering Sciences, University of Oxford

Synthesizing robust distributed controllers: when is information enough?,
Feb 2018
Seminar talk at IfA, ETH - Zurich

Control of constrained systems given an information structure,
Dec 2017
Presentation of the paper [C3] in Melbourne, IEEE Conference on Decision and Control

LANGUAGES

Italian: Native
English: Proficient (C2),
German: Upper-Intermediate (B2/C1)
Japanese: Intermediate (B2)
French: Basic (A2)

CAE Grade A

B2 internal exam, ongoing studies

JLPT N3

DELF A2

INTERESTS

Technology & research. Piano playing. Traveling. Learning languages. (And others!)

RESEARCH OUTPUT

JOURNAL PUBLICATIONS

[J6] System-level, Input-output and New Parameterizations of Stabilizing Controllers, and Their Numerical Computation, *Y. Zheng, L. Furieri, M. Kamgarpour, N. Li, Automatica, submitted*

[J5] Learning the Globally Optimal Distributed LQ Regulator, *L. Furieri, Y. Zheng, M. Kamgarpour, Proceedings of Machine Learning Research and Learning For Dynamics and Control Conference (L4DC), 2020, to appear*

[J4] Sparsity Invariance for Convex Design of Distributed Controllers, *L. Furieri, Y. Zheng, A. Papachristodoulou, M. Kamgarpour, IEEE Transactions on Control of Network Systems (TCNS), to appear*

[J3] On the Equivalence of Youla, System-level and Input-output Parameterizations, *Y. Zheng, L. Furieri, A. Papachristodoulou, N. Li, M. Kamgarpour, IEEE Transactions on Automatic Control (TAC)*

[J2] An Input-Output Parametrization of Stabilizing Controllers: amidst Youla and System Level Synthesis, *L. Furieri, Y. Zheng, A. Papachristodoulou, M. Kamgarpour, IEEE Control Systems Letters (LCSYS)*

[J1] Unified Approach to Convex Robust Distributed Control given Arbitrary Information Structures, *L. Furieri, M. Kamgarpour, IEEE Transactions on Automatic Control (TAC)*

CONFERENCE PUBLICATIONS

[C8] First Order Methods For Globally Optimal Distributed Controllers Beyond Quadratic Invariance, *L. Furieri, M. Kamgarpour, American Control Conference (ACC), 2020, to appear*

[C7] On Separable Quadratic Lyapunov Functions for Convex Design of Distributed Controllers, *L. Furieri, Y. Zheng, A. Papachristodoulou, M. Kamgarpour, European Control Conference (ECC), 2019, Best Student Paper Award (finalist, top 5)*

[C6] Robust Distributed Control Beyond Quadratic Invariance, *L. Furieri, M. Kamgarpour, Proceedings of the Annual Conference on Decision and Control (CDC), 2018*

[C5] Reducing HVDC Network Oscillations Considering Wind Intermittency Through Optimized Grid Expansion Decision *A. Elahidoost, L. Furieri, E. Tedeschi, M. Kamgarpour, IEEE Energy Conversion Congress and Exposition (ECCE), 2018, 2683–2690*

[C4] Optimizing HVDC Grid Expansion and Control For Enhancing DC Stability *A. Elahidoost, L. Furieri, E. Tedeschi, M. Kamgarpour, Proceedings of the Power Systems Computation Conference (PSCC), 2018, 1–7*

[C3] Robust Control of Constrained Systems given an Information Structure *L. Furieri, M. Kamgarpour, Proceedings of the Annual Conference on Decision and Control (CDC), 2017, 3481–3486*

[C2] Gone with the wind: nonlinear guidance for small fixed-wing aircraft in arbitrarily strong windfields *L. Furieri, T. Stastny, L. Marconi, R. Siegwart, I. Gilitschenski, Proceedings of the American Control Conference (ACC), 2017, 4254–4261, O. Hugo Schuck Best Paper Award*

[C1] Internal model-based control for loitering maneuvers of UAVs, *G. Casadei, L. Furieri, N. Mimmo, R. Naldi, L. Marconi, Proceedings of the European Control Conference (ECC), 2016, pp. 672-677*