

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)

From: **Oct, 2014**
To: **Oct 2016**

Thesis: *A new guidance law for fixed-wing UAVs in arbitrarily strong wind fields*

Grade: 110/110 with honors, 29.80/30 average grade, top 1%

Excellence curriculum, Collegio Superiore
(University of Bologna, Italy)

From: **Oct, 2011**
To: **Oct 2016**

Admission through national competition in 2011 (5% acceptance rate)

Bachelor's degree in automation engineering
(University of Bologna, Italy)

From: **Oct, 2011**
To: **Oct 2014**

Thesis: *Trajectory planning for Swarms of Quadrotors*

Grade: 110/110 with honors, 29.27/30 average grade

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,

Jun 2018

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) [\[link\]](#), [\[News snippet\]](#)

Best Student Paper Award @ ECC19, finalist

Jun 2019

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, [\[link\]](#)

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)	Autumns 2017, 2018, 2019
	Control Systems II (ETH, M.Sc. level course)	Spring 2019
	Advanced Topics in Control (ETH, M.Sc. level course)	Springs 2017, 2018
	Luca Varano, semester thesis supervision <i>Distributed Control for Platooning of Autonomous Vehicles</i>	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, <i>Presentation of the paper [J2] in Nice, IEEE Conference on Decision and Control</i>	Dec 2019
	On separable quadratic Lyapunov functions for convex design of distributed controllers, <i>Presentation of the paper [C7] in Naples, European Control Conference</i>	Jun 2019
	Robust distributed control beyond quadratic invariance, <i>Presentation of the paper [C6] in Miami, IEEE Conference on Decision and Control</i>	Dec 2018
	Convexity and performance bounds in synthesizing distributed controllers <i>Invited talk at the Department of Engineering Sciences, University of Oxford</i>	Aug 2018
	Synthesizing robust distributed controllers: when is information enough?, <i>Seminar talk at IfA, ETH - Zurich</i>	Feb 2018
	Control of constrained systems given an information structure, <i>Presentation of the paper [C3] in Melbourne, IEEE Conference on Decision and Control</i>	Dec 2017
LANGUAGES	Italian: Native	
	English: Proficient (C2),	CAE Grade A
	German: Upper-Intermediate (B2/C1)	B2 internal exam, ongoing studies
	Japanese: Intermediate (B2)	JLPT N3
	French: Basic (A2)	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. Siegart, 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*