Luca Furieri - Curriculum Vitae

email	furieril@control.ee.ethz.ch
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: **Jul, 2020**

EDUCATION

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

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: *Trajectory planning for Swarms of Quadrotors*
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,   **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   **Jan 2016**
International application number PCT/IB2017/050405

COMPUTER SKILLS

MATLAB & Simulink: 5+ years experience developing complex control systems
C/C++: basic programming skills
YALMIP & ACADO optimization toolboxes
Others: basic experience with: HIL (hardware-in-the-loop) simulations with Pixhawk/PX4, OpenCV

TEACHING &	Linear Systems Theory (ETH, M.Sc. level course)	**Autumns 2017, 2018, 2019**
SUPERVISION	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 **Oct 2019 - Jan 2020**
Distributed Control for Platooning of Autonomous Vehicles

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 **Jun 2019**
distributed controllers,
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),	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

[**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), conditionally accepted_

[**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), conditionally accepted_

[**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

[**C9**] Learning the Globally Optimal Distributed LQ Regulator, _L. Furieri, Y. Zheng, M. Kamgarpour, Learning For Dynamics and Control (L4DC), 2020, submitted_

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

[**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_