Matteo Della Rossa

Age	30	**Email**	matteo.dellarossa@uclouvain.be
Nationality	Italian		

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Education

'11-'15 Bachelor in Mathematics- University of Udine / Italy

'15-'17 Master in Mathematics (110/110 cum laude) - University of Udine / Italy

Thesis's Title: *Esistence And Uniqueness Results in Nonlinear Analysis*
Under the diretion of Prof. *Fabio Zanolin*

'17-'20 Ph. D. in Automatic Control -University of Toulouse, INSA
& Laboratory for Analysis and Architecture of Systems (LAAS-CNRS) / Toulouse, France

Thesis's Title: *Non-Smooth Lyapunov Functions for Stability Analysis of Hybrid Systems*
Under the direction of Dr. *Aneel Tanwani* and Prof. *Luca Zaccarian*

2-months visiting period at Imperial College London, London / UK
Under the direction of Prof. *David Angeli*

Research Papers

Journal (published)

1. Della Rossa, M. and Tanwani, A. and Zaccarian, L. (2020). Max-min Lyapunov functions for switched systems and related differential inclusions. *Automatica*, vol. 120, 109123.
2. Della Rossa, M. and Goebel, R. and Tanwani, A. and Zaccarian, L.(2021). Piecewise structure of Lyapunov functions and densely checked decrease conditions for hybrid systems. *Math. Control Signals Syst.* , vol. 33, pp. 123-149.
3. Della Rossa, M. and Tanwani, A. and Zaccarian, L. (2021). Non-pathological ISS-Lyapunov functions for interconnected differential inclusions. *IEEE Transactions on Automatic Control, vol. 67, no. 8, pp. 3774-3789.*
4. Della Rossa, M. and Tanwani, A. (2022). Instability of dwell-time constrained switched nonlinear systems. *Systems & Control Letters*, vol. 162, 105164.
5. Della Rossa, M. and Pasquini, M. and Angeli, D. (2022). Continuous-time switched systems with switching frequency constraints: Path-complete stability criteria. *Automatica*, vol. 137, 110099.
6. Debauche, V. and Della Rossa, M. and Jungers, R. (2022) Comparison of path-complete Lyapunov functions via template-dependent lifts. *Nonlinear Analysis: Hybrid Systems*, vol. 46, 101237.

Journal (submitted)

1. Della Rossa, M. and Egidio, L. N. and Jungers, R. (n.d.) Stability of switched affine systems: arbitrary and dwell-time switching

International Conferences (published)

1. Della Rossa, M. and Tanwani, A. and Zaccarian, L. (2018). Max-min Lyapunov functions for switching differential inclusions. *IEEE 57th Conference on Decision and Control (CDC)*, pages. 5664-5669.
2. Della Rossa, M. and Tanwani, A. and Zaccarian, L. (2019). Smooth approximation of patchy Lyapunov functions for switched systems. *11th IFAC Symposium on Nonlinear Control Systems (NOLCOS),* pages. 2405-8963.

3. Della Rossa, M. and Goebel, R. and Tanwani, A. and Zaccarian, L. (2019). Almost everywhere conditions for hybrid Lipschitz Lyapunov functions. *IEEE 58th Conference on Decision and Control (CDC)*, pages. 8148-8153.

4. Della Rossa, M. and Pasquini, M. and Angeli, D. (2020). Path-complete Lyapunov functions for continuous-time switching systems. *IEEE 59th Conference on Decision and Control (CDC)*, pages. 3279-3284.

5. Debauche, V. and Della Rossa, M. and Jungers, J. (2021). Template-dependent lifts for path-complete stability criteria and application to positive switching systems. *7th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS)*, pages. 151-156.

6. Della Rossa, M. and Wang, Z. and Egidio, L.N. and Jungers, R. (2021). Data-driven stability analysis of switched affine systems. *IEEE 60th Conference on Decision and Control (CDC)*, pages. 3204-3209.

7. Debauche, V. and Della Rossa, M. and Jungers, R. (2022) Necessary and sufficient conditions for template-dependent ordering of path-complete Lyapunov methods. *25th ACM International Conference on Hybrid Systems: Computation and Control (HSCC)*

International Conferences (submitted)

1. Della Rossa, M. and Jungers, R. (2022) *Almost sure Stability of Stochastic Switched Systems: Graph lifts-based Approach* Submitted to CDC22

2. Alves Lima, T. and Della Rossa, M. and Gouaisbaut, F. and Jungers, M. and Tarbouriech, S. (2022) *Switched systems approach to stability of systems with both constant and time-varying delays* Submitted to CDC22

Employment History

Nov '20 - Université Catholique de Louvain - *Louvain-La-Neuve / Belgium*
Postdoc / ICTEAM

Part of the Project of the European Research Council (ERC) under the *European Union's Horizon 2022 research and innovation program*, grant agreement No 864017 - L2C.
Principal Investigator: Prof. *Raphaël M. Jungers.*

Teaching Assistant

Jan '19 - Jun '19 Basic Mathematics
IUT-GMP Toulouse-Université Toulouse III Paul Sabatier, 64h

Doctorant Chargé d'Enseignement/ PhD teaching assistant

Sep '19 - Jan '20 Tutorial in Linear Algebra and Analysis
INSA Toulouse- Génie Mathématique et Modélisasion, 18h

PhD teaching assistant

Sep '21 - Jan '22 LINMA2380 - Matrix Computations
Université catholique de Louvain (UCLouvain), Louvain-La-Neuve, Belgium, 20h

Teaching assistant

Reviewer and Editorial activities

I have continuously and actively been a reviewer for several journals in optimization and automatic control fields, such as *Automatica*, *IEEE Transactions on Automatic Control*, *Systems and Control Letters*, *IEEE Control Systems Letters*, *Nonlinear Analysis: Hybrid Systems*, and for international conferences relevant to the sector, such as *IEEE Conference on Decision and Control*, *IFAC World Congress.*

Invited Lectures

05/09/2019 Title: "Smooth Approximation of Patchy Lyapunov Functions for Switched Systems"
11th IFAC Symposium on Nonlinear Control Systems (NOLCOS), Vienna, Austria

12/12/2019 Title: "Almost Everywhere Conditions for Hybrid Lipschitz Lyapunov Functions"
IEEE 58th Conference on Decision and Control (CDC) Nice, France

09/11/2020 Title: "Path-complete techniques and contiunous-time systems, recent developements"
ICTEAM, Cyber-Physical systems research group weekly meeting, Louvain-La-Neuve, Belgique

16/12/2020 Title: "Path-complete Lyapunov functions for continuous-time switching systems"
IEEE 59th Conference on Decision and Control (CDC) (Virtual)

15/12/2021 Title: "Data-Driven Stability Analysis of Switched Affine Systems"
IEEE 60th Conference on Decision and Control (CDC) (Virtual)

09/06/2022 Title: "Dwell-time stability analysis for switched systems:
from linear to (very structured) non-linear subsystems"
Séminaire d'Automatique du Plateau de Saclay, L2S, CentraleSupélec, Paris-Saclay, France

Languages

	English	French	Portuguese (BR)	Italian
Speaking	Excellent	Excellent	Good	Mother tongue
Writing	Excellent	Very Good	Beginner	
Reading	Excellent	Excellent	Very Good	
Listening	Excellent	Excellent	Very Good	

General Skills

- **Programming Languages**
  MatLab
- **Miscellaneous**
  Google Apps
  Office Package
  LaTeX
  Driver's license "B"

Referees

- **Prof. Luca Zaccarian**
  Professor (Google Scholar, Homepage)
  LAAS-CNRS, Toulouse, France and
  University of Trento, Italy
  7 avenue du Colonel Roche,
  31400 Toulouse, France
  email: luca.zaccarian@laas.fr
  Phone: +33 5 61337890
- **Dr. Aneel Tanwani**
  CNRS Researcher (Google Scholar, Homepage)
  LAAS-CNRS, Toulouse, France
  7 Avenue du Colonel Roche
  31400 Toulouse, France
  email: aneel.tanwani@laaf.fr
- **Prof. Raphaël M. Jungers**
  Professor (Google Scholar, Homepage)
  UCLouvain
  ICTEAM Institute, Avenue Georges Lemaître, 4-6
  1348 Louvain-la-Neuve (Belgium)
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