Mauro Faccin
Curriculum Vitæ

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Actual Position

2023-today	**DIMEC at University of Bologna**	University of Bologna, Italy

Interests/Research line
- Use of complex systems and machine learning tools to detect antibiotic resitance
- Mesoscopic structures and their influence on the dynamical system
- Applied data analysis for disease control
- Analysis of information dynamics in social networks and medical systems

Professional Experience

2021 - 2022	**Université de Paris, (CEPED and IRD)**	Paris, France
	Postdoctoral researcher	
2015 - 2020	**Université Catholique de Louvain (ICTEAM)**	Louvain la Neuve, Belgium
	MOVE IN Louvain Research Fellow	
2011 - 2015	**ISI Fundation**	Torino, Italy
	Junior researcher	
2006 - 2011	**Bifi Institute**	Zaragoza, Spain
	PhD	

Fellowships and Projects

2021 - 2022	**TRACTRUST (ANR-20-COVI-0102)**
2017 - 2021	**Innoviris Iris-TB (D1.31402.007-F)**
2015 - 2017	**MOVE-IN Louvain Fellowship (with support of Marie Curie Actions)**

Membership

2018 - today	**SICC - Italian Society for Chaos and Complexity**	
2015 - today	**Network Science Society**	
	Member	
2014 - today	**Complex Systems Society**	
	Member	
2013 - today	**Frontiers in Quantum Computing**	
	Review Editor	

Program Committees

1 Dec 2021	**Complex Networks 2021**	Madrid, Spain
1 Dec 2020	**Complex Networks 2020**	Madrid, Spain
10 Dec 2019	**Complex Networks 2019**	Lisbon, Portugal
22 Feb 2019	**BeNet 2019**	Hasselt, Belgium
11 Dec 2018	**Complex Networks 2018**	Cambridge, UK
29 Nov 2017	**Complex Networks 2017**	Lyon, France
30 Nov 2016	**Complex Networks 2016**	Milan, Italy

Organizing Committees

August 2019	**Network Reconstruction Science-athon**	Beaumont, Belgium

Coorganized with Alexandre Bovet, Benjamin Chiem, Leo Gutierrez, Alexey Medvedev, Leto Peel, Mridul Seth

15 Dec 2016	**Belgian Network Research Meeting (BeNet) 2016**	Louvain-la-Neuve, Belgium
	Coorganized with Sophie Béreau, Jean-Charles Delvenne, Yerali Gandica, Leo Gutierrez, Leto Peel, Michael Schaub	
21 Sep 2016	**Conference on Complex Systems 2016 workshop on Coarse-graining Complex Systems**	
		CCS2016, Amsterdam, Netherlands
	Coorganized with Leto Peel, Renaud Lambiotte, Michael Schaub	
2 Jun 2014	**Quantum Frontiers for Network Science**	NetSci 2014, Berkeley, California
	Coorganized with Filippo Radicchi and Zoltan Zimborás	

REVIEWER

- Advances in Complex Systems
- Applied Network Science
- APS (Physical Review E)
- Journal of Complex Networks
- Journal of Statistical Mechanics
- Natural Computing
- PLOS ONE
- Science Advances
- Scientific Reports

TEACHING

2015-2020	**LINMA2111 Algorithms and Complexity**	Assistant Professor
	Université Catholique de Louvain	
2005	**Physics and Math at primary school**	Hetauda, Nepal
	NEST	
2004	**guide in Science Museum**	Padova, Italy
	Organizer: INFN	

STUDENT ADVISING

2019	**G. Izzi**	University of Turin
	Computer Science (with A. Semeraro)	
2016	**H. Devillez**	UCLouvain
	Applied Maths (with L. Peel)	
2016	**M. Huet**	UCLouvain
	Elec. Eng. (with L. Peel)	

EDUCATION

2020	**24CFU**	Univestità telematica Pegaso
	Discipline antropo-psico-pedagogiche e in metodologie e tecnologie didattiche	
14 Sept 2012	**PhD in Physics**	University of Zaragoza
	supervisor: prof. Pierpaolo Bruscolini	
	Analysis and Development of Algorithms for the Characterization of Biopolymers and Application to Protein Sequencing and Protein Folding	
15 Oct 2008	**Master in Physics and Technology**	University of Zaragoza
	supervisor: prof. Pierpaolo Bruscolini	
	Coevolution of Strategy and Population Structure in the Prisoner Dilemma	
10 Oct 2005	**MSc in Physics**	University of Padova
	supervisor: prof. Enzo Orlandini	
	Beris Edwards Model Simulations for Liquid Crystals in Oscillatory Poiseuille Flux	

MAINTEINED PROJECTS

- AISA
  Python module aimed at partitioning a network through Autoinformation maximization
- CartoTB
  Cartography of predicted tuberculosis in high burden settings

PREPRINTS

- Temporal and geographic analysis of the Hydroxychloroquine controversy in the French Twittosphere   arXiv:2304.14075
  M. Faccin, E. Schultz and F. Gargiulo

PUBLICATIONS

- Measuring dynamical systems on directed hypergraphs   Phys Rev E, 106 (034306), 2022
  M. Faccin
- Assessing the influence of French vaccine critics during the two first years of the COVID-19 pandemic   PLOS ONE, 17(8): e0271157
  M. Faccin, F. Gargiulo, L. Atlani-Duault, J.K. Ward
- Data-driven identification of communities with high levels of tuberculosis infection in the Democratic Republic of Congo.   Sci Rep 12, 3912 (2022)
  M. Faccin, O. Rusumba, A. Ushindi, M. Riziki, T. Habiragi, F. Boutachkourt, E. André
- State aggregations in Markov chains and block models of networks
      Phys. Rev. Lett., 127, 078301 (2021)
  M. Faccin, M.T. Schaub and j.-C. Delvenne
  <small>Figure selected for the journal cover</small>
- Complex Networks from Classical to Quantum   Communications Physics 2-53 (2019)
  J. Biamonte, M. Faccin, M. De Domenico
- Outbreak of multidrug-resistant tuberculosis in South Africa undetected by WHO-endorsed commercial tests: an observational study
      The Lancet Infectious Diseases 2018
  Makhado, Matabane, Faccin, Pinçon, Jouet, Boutachkourt, Goeminne, Gaudin, Maphalala, Beckert, Niemann, Delvenne, Delmée, Razwiedani, Nchabeleng, Supply, de Jong, André
- Entrograms and coarse graining of dynamics on complex networks
      Journal of Complex Networks
  M. Faccin, M.T. Schaub, J-C. Delvenne
- Chiral Quantum Walks   Phys. Rev. A 93, 042302
  D. L. Lu, J. D. Biamonte, J. Li, H. Li, T. H. Johnson, V. Bergholm, M. Faccin, Z. Zimborás, R. Laflamme, J. Baugh, and S. Lloyd
- Mapping the topography of a protein energy landscape
      J. Am. Chem. Soc., 2015, 137 (46), pp 14610–14625
  R. D. Hutton, J. Wilkinson, M. Faccin, E. M. Sivertsson, A. Pelizzola, A. R. Lowe, P. Bruscolini, L. S. Itzhaki
- Community Detection in Quantum Complex Networks
      Phys. Rev. X 4 (4 2014), p. 041012
  M. Faccin, P. Migdał, T. H. Johnson, V. Bergholm, and J. D. Biamonte
- Degree Distribution in Quantum Walks on Complex Networks
      Phys. Rev. X 3 (4 2013), p. 041007
  M. Faccin, T. Johnson, J. Biamonte, S. Kais, and P. Migdał
- Quantum Transport Enhancement by Time-Reversal Symmetry Breaking
      Sci. Rep. 3 (2013). Ed. by NPG, p. 2361
  Z. Zimboras, M. Faccin, Z. Kadar, J. Whitfield, B. Lanyon, and J. Biamonte
- MS/MS Spectra Interpretation as a Statistical-Mechanics Problem
      Analytical Chemistry 85.10 (2013), pp. 4884–4892
  M. Faccin and P. Bruscolini
- Ground-state spin logic   Europhysics Letters 99.5 (2012), p. 57004
  J. D. Whitfield, M. Faccin, and J. D. Biamonte

- Analysis of the equilibrium and kinetics of the ankyrin repeat protein myotrophin
  The Journal of Chemical Physics 134.7, 075102 (2011), p. 075102
  M. Faccin, P. Bruscolini, and A. Pelizzola

CONFERENCES (ORAL CONTRIBUTIONS)

7 March 2023 — **Dynamical systems as a mean for complex systems analysis**
seminar at the University of Bologna
M. Faccin

9 Nov 2022 — **Data-driven mapping of tuberculosis incidence allows identifying communities with high circulation of tuberculosis in the Democratic Republic of Congo**
The Union Conference 2022 – Online
M. Faccin, C. Nsop Mulaj, E. Swana Kawana, T. Yav Ikum, E. Andé

9 Nov 2022 — **Identification of urban areas presenting high incidence of tuberculosis using satellite images allows increasing the yield of active case finding in Kigali, Rwanda.**
The Union Conference 2022 – Online
M. Faccin, P Uwizeye, F. Nsabimana, P. Migambi, E. André

17 Oct 2022 — **Use of compartmental models to detect high TB incidence rates in South-Kivu (DRC)**
CCS 2022 @ Palma de Mallorca/Online
M. Faccin, E. André

- **Reach of vaccine-critical content on Twitter during the COVID-19 pandemic**
French Regional Conf. on Complex Systems (FRCCS) @ Paris
M. Faccin, F. Gargiulo

30 May 2022 — **Outreach of vaccine-critic content on French-speaking Twitter**
Complenet 2022 – Online
M. Faccin, F. Gargiulo, J. Ward

2 Dec 2021 — **Autoinformation state aggregation**   Complex Networks 2021 @ Madrid (Spain)
M. Faccin, M. T. Schaub, J-C. Delvenne

30 Nov 2021 — **Vaccine-critical discourse on French-speaking Twitter and its outreach**
Complex Networks 2021 @ Madrid (Spain)
M. Faccin, F. Gargiulo, J. Ward
Best lightning talk award

19 Oct 2021 — **State aggregation for dynamical systems: An information-theoretic approach**
Math Dept, Oxford University, (UK – Online)
Network Seminar 2021

7-9 Dec 2020 — **Using predictive models and risk assessment tools to find unreported TB cases**
Washingthon DC, USA (online)
Global Digital Health Forum 2020

20-24 Oct 2020 — **Data-driven TB active-case finding in South Kivu (DRC)**   Paris, France (online)
The Union 2020

10-12 Dec 2019 — **Auto-information in non-Markovian diffusion systems**   Lisbon, Portugal
Complex Networks 2019

22 Feb. 2019 — **Variable aggregation for dynamical systems on networks**   Hasselt, Belgium
Benet 2019

23-28 Sept. 2018 — **A dynamical approach to block structure analysis**   Thessaloniki, Greece
CCS 2018

11-15 Jun 2018 — **Dynamical Markov Modules**   Paris, France
Netsci 2018

21-24 Mar 2017 — **Community detection in networks with non-Markovian dynamics** Dubrovnik, Croatia
CompleNet 2017

30 Nov-2 Dec 2016 — **Behind Communities: Dynamics Define Modules**   Milan, Italy
ComplexNetworks 2016

19-22 Sep 2016 — **Beyond Communities: Dynamical Markov Modules**   Amsterdam, Netherlands
CCS 2016

May 30-June 3 2016 — **Mesoscopic Structure And Diffusion Process Memory**   Seoul, Korea
NetSci 2016

10-15 Jan 2015 — **Mesoscopic Structures and Diffusion Process Memory**   Wrocław, Poland
NetSci-X 2016

2-6 Jun 2015 — **Structural controllability of EEG temporal causal networks**   Zaragoza, Spain
NetSci 2015

22-26 Sep 2014 — **Quantum Approaches to Community Detection**   Lucca, Italy
ECCS 2014

12-14 Mar 2014	**Community detection on quantum systems** CompleNet 2014	Bologna, Italy
22-24 Jan 2014	**Community Detection on Quantum Systems** BIFI2014	Zaragoza, Spain
24-26 May 2013	**Degree distribution in quantum complex networks** IQC workshop on quantum computation and complex networks	Waterloo, Canada
6-8 Nov 2012	**Ground state spin logic** Tensor Network States and Algebraic Geometry Workshop	Torino, Italy
2-4 Feb 2011	**Equilibrium and kinetics of the ankyrin repeat protein Myotrophin through a simple statiscical mechanical model** V BIFI National Conference	Zaragoza, Spain
5-7 Feb 2009	**Bayesian Characterization of Protein Tandem Mass Spectra** IV BIFI National Conference	Zaragoza, Spain
8-9 May 2008	**Noise description in MSMS mass spectrometry, looking for a de novo sequencing algorithm** VI Jornadas Aragonesas de Estabilidad y Plegamiento de Proteínas	San Sebastian, Spain

Conferences (Poster Contributions)

1 Dec 2021	Directed hyper-graphs and dynamical systems M. Faccin, F. Gargiulo	Complex Networks 2021 @ Madrid (Spain)
17-25 Sept 2020	State aggregation in non-Markovian systems by auto-information maximization Netsci 2020	Rome, Italy
17-25 Sept 2020	The variability of network structures inferred from time series data Netsci 2020	Rome, Italy
10-12 Dec 2019	The variability of network structures inferred from time series data Complex Networks 2019	Lisbon, Portugal
1-3 July 2019	**Variable aggregation on (broadcasting) networks** CCS/Italy 2019	Trento, Italy
23-25 Mar 2016	**Memory and Mesoscopic Structures in Diffusion Processes** Complenet 2016	Dijon, France
7-10 Jul 2010	**Folding Pathways Characterization for Ankyrin Repeat Protein Myotrophin** IV Spanish Portuguese Biophysical Congress	Zaragoza, Spain
2-6 Jun 2008	**Statistical characterization of fragment ions in MSMS mass spectrometry** XXI Sitges Conference on Statistical Mechanics: Statistical Mechanics of Molecular Biophysics	Sitges, Spain

Computer skills

Coding	Python, C, Matlab, Fortran
Shell	Bash, iPython/Jupyter
Versioning	GIT, Subversion, Mercurial
Plotting	Gnuplot, Matplotlib, PGFPlots(LaTeX)
Typesetting	LaTeX, LibreOffice, MSOffice, Markdown
Imaging	Gimp (Raster), Tikx (LaTeX), Inkscape (Vectorial), Rawtherapee (RAW)
Web	HTML5, CSS/SCSS, static site generators, Wordpress

Languages

Italian	Mother tongue
English	Fluent
Spanish	Fluent
French	Fair

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