MAURO FACCIN
Curriculum Vitæ

Dip. di Scienze Mediche e Chirurgiche
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Preferred pronouns: he/him

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

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

CONFERENCES (POSTER CONTRIBUTIONS)

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

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**

Mauro Faccin