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)** — 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, Physical Review X)
- Journal of Complex Networks
- Journal of Statistical Mechanics
- Natural Computing
- PLOS ONE
- Science Advances
- Scientific Reports

TEACHING

2023-2024	**DAT301 Social Network Analysis** University Mohammed VI Polytechnic	Teacher Assistant
2015-2020	**LINMA2111 Algorithms and Complexity** Université Catholique de Louvain	Assistant Professor
2005	**Physics and Math at primary school** NEST	Hetauda, Nepal
2004	**guide in Science Museum** Organizer: INFN	Padova, Italy

STUDENT ADVISING

2024	**N. Barbieri** Physics (tesi magistrale with F. Durazzi)	University of Bologna
2019	**G. Izzi** Computer Science (tesi magistrale with A. Semeraro)	University of Turin
2016	**H. Devillez** Applied Maths (with L. Peel)	UCLouvain
2016	**M. Huet** Elec. Eng. (with L. Peel)	UCLouvain

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

<small>Coevolution of Strategy and Population Structure in the Prisoner Dilemma</small>

| 10 Oct 2005 | **MSc in Physics** | University of Padova |

supervisor: prof. Enzo Orlandini

<small>Beris Edwards Model Simulations for Liquid Crystals in Oscillatory Poiseuille Flux</small>

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** NetSci 2016	Seoul, Korea
10-15 Jan 2015	**Mesoscopic Structures and Diffusion Process Memory** NetSci-X 2016	Wrocław, Poland
2-6 Jun 2015	**Structural controllability of EEG temporal causal networks** NetSci 2015	Zaragoza, Spain
22-26 Sep 2014	**Quantum Approaches to Community Detection** ECCS 2014	Lucca, Italy
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**

Mauro Faccin