Thomas Louf

Assistant prof. of applied maths

Profiles
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Education

PhD in Physics of Complex Systems Nov 2019 - Sep 2023

- Institute for Cross-Disciplinary Physics and Complex Systems (IFISC), Palma, Spain
  With José J. Ramasco and David Sánchez as supervisors of my thesis, entitled "Complexity in sociolinguistics: exploring the interplay between geography, culture and the social fabric".
  María de Maeztu Unit of Excellence PhD position.
- Department for Network and Data Science (DNDS), CEU, Vienna, Austria Sep 2022 - Dec 2022
  Research stay with Márton Karsai for a project investigating the interplay between socio-economic inequalities and language. Funded with a competitive mobility grant from Santander.

MSc in Physics Sep 2018 - Sep 2019

Imperial College, London, UK
12-month taught programme with selected courses in Complexity & Networks, Computational Physics, Atmospheric Physics, General Relativity (among others).
Thesis with Tim Evans entitled "An axiomatic study of spatial interaction models".

Diplôme d'Ingénieur Sep 2015 - Sep 2019

Ecole Centrale de Lyon, France
Broad engineering training with selected courses in quantum physics, nuclear engineering and observation of matter. Last year at Imperial College as part of a joint degree programme.

Preparatory classes to Grandes Écoles exams Sep 2013 - Sep 2015

Collège Stanislas, Paris, France

Research employment

Assistant professor Sep 2025 - now

Grupo Interdisciplinar de Sistemas Complejos (GISC), Departamento de Matemáticas, Universidad Carlos III de Madrid (UC3M), Spain

Postdoctoral researcher Oct 2023 - Aug 2025

Complex Human Behaviour Lab, Fondazione Bruno Kessler, Trento, Italy
I work on the AI4TRUST European project, on the collection of Telegram data and the analysis of its network of channels to study the diffusion of misinformation. I am also involved in the modelling of change in mobility behaviour for the Bologna Digital Twin project. I have supervised one MSc thesis and am co-supervising a PhD thesis. I also manage the lab's website and its server, for which I implemented a Coder development envrionment and a Netdata monitoring platform.

Publications

1. Orsanigo, V. ***et al.*** The Geography of Interest in International Conversations on Twitter. ***EPJ Data Science*** https://doi.org/10.1140/epjds/s13688-025-00597-z (2025) doi:10.1140/epjds/s13688-025-00597-z.
2. Louf, T., Ramasco, J. J., Sánchez, D. & Karsai, M. When Dialects Collide: How Socioeconomic Mixing Affects Language Use. ***EPJ Data Science*** **14,** 1–21 (2025).
3. Baqir, A. ***et al.*** Unveiling the Drivers of Active Participation in Social Media Discourse. ***Scientific Reports*** **15,** 4906 (2025).
4. Louf, T., Gonçalves, B., Ramasco, J. J., Sánchez, D. & Grieve, J. American Cultural Regions Mapped through the Lexical Analysis of Social Media. ***Humanities and Social Sciences Communications*** **10,** 1–11 (2023).
5. Louf, T., Sánchez, D. & Miguel Franco, R. Algoritmos de Agrupamiento y Lingüística de Corpus: Ortografía y Léxico en Documentos Mallorquines del Siglo XVIII. in ***Scripta manent. Historia del español, documentación archivística y humanidades digitales*** (Peter Lang, New York, NY, USA, 2023).
6. Louf, T., Sánchez, D. & Ramasco, J. J. Capturing the Diversity of Multilingual Societies. ***Physical Review Research*** **3,** 43146 (2021).
7. Ganić, E. ***et al.*** Dynamic Noise Maps for Ljubljana Airport. in ***10th SESAR Innovation Days*** (2020). doi:10.5281/zenodo.5517304.

Teaching

Discrete mathematics 2026-2027
Bachelor in Artificial Intelligence, Bachelor in Data Science and Engineering, UC3M
Source material: `https://github.com/tlouf/discrete_maths`

Mathematics for data analysis 2025
Master in Big Data Analytics, UC3M
Source material: `https://github.com/tlouf/maths_data_analysis`

Python for data science 2024-2025
Data Science Summer School, University of Trento
Source material: `https://github.com/tlouf/Py4DataSci-course`

Supervision

- Supervised the MSc thesis "Analyzing and modelling the temporal network of Telegram's chats". Defended by Aurora Vindimian at the Department of Mathematics, University of Trento (2024).
- Co-supervising the PhD thesis of Veronica Orsanigo, together with Dr. Riccardo Gallotti. Defense expected in 2026-2027, at the Department of Information Engineering and Computer Science of the University of Trento.

Funding

- UC3M grant (10000€) within the 2025 competitive call for grants for the research activity of young doctors (project-based).
- Seal of Excellence for an MSCA Postdoctoral Fellowship application (2024).
- Joint mobility grant (4000€) from Santander - University of the Balearic Islands to fund a 4-month research stay at the Central European University of Vienna (2022).

Talks

International Conference on Complex Networks (CompleNet) 2026
Uncovering the structure and dynamics of information flow on the Telegram network
May 2026, Zaragoza, Spain

Journée d'étude Espace & Interactions
A few shades of complexity to model spatial interactions
November 2025, Gustave Eiffel University, Champs-sur-Marne, France

Conference on Complex Systems 2025
Uncovering the structure and dynamics of information flow on the Telegram network
September 2025, University of Siena, Italy

CSS French Local Chapter Conference on Complex Systems
Uncovering the structure and dynamics of information flow on the Telegram network
June 2025, Sorbonne University, Paris, France

Colloquium of the Centre for Human | Data | Society
When Dialects Collide: How Socioeconomic Mixing Affects Language Use
December 2024, University of Konstanz, Germany

Conference on Complex Systems 2024
When Dialects Collide: How Socioeconomic Mixing Affects Language Use
September 2024, University of Exeter, UK

International Conference on Computational Social Science (IC2S2) 2023
Not sticking by the rules: how the use of standard language varies with socio-economic status and social mixing
July 2023, Copenhagen, Denmark

COMPILA satellite of the Conference on Complex Systems 2022
American cultural regions mapped through the lexical analysis of social media
October 2022, Palma, Spain

VII COMSOTEC Workshop 2022
Capturing the diversity of multilingual societies
April 2022, Tarragona, Spain

Conference on Complex Systems 2021
Capturing the diversity of multilingual societies
October 2021, Lyon, France

Computational Social Science satellite of the Conference on Complex Systems 2020
Bilingual societies: from data to agent-based modeling
December 2020, Online

Technical skills

Programming (Python)
(Geospatial) data processing, (interactive) visualization, parallel computing on a server cluster, natural language processing, machine learning. I publish all code used in my projects in GitHub repositories, develop small packages (querier, spylt) and contribute occasionally to libraries such as GeoPandas, pandas, networkx and Gensim.

Programming (others)
Version control with git, Linux proficiency, documentation writing with Sphinx, Rust (beginner).

Communication
Fluent in French, English, Spanish, and advanced level in Italian. Proficient with LaTeX, Typst, Inkscape, GIMP.

Academic service

- Elected member of the Advisory Board of the young researchers of the Complex Systems Society (yrCSS) in 2023, and subsequently Chair of the Board in 2024.
- Co-organiser of the Computational Social Science satellite of the Conference on Complex Systems, yearly, from 2023.
- Served as a reviewer for Physica A and the Journal of Linguistic Geography.
- Helped the organization of the Conference on Complex Systems 2022 in Palma.

Other work experiences

Data science intern Jan 2018 - Jul 2018
HousingAnywhere, Rotterdam, Netherlands
I analyzed operational data from a large SQL database to provide insights to other teams. I also carried out machine learning projects, such as a tool to forecast the company's revenue, taking into account seasonality and growth.

Research intern May 2017 - Oct 2017
CEA Irfu, Saclay, France
I investigated the potential of Micromegas gaseous detectors for X-ray spectro-polarimetry. I performed

experiments to test its performance and analysed data collected at the SOLEIL synchrotron to calibrate a detector.

References

- Dr. José J. Ramasco (PhD supervisor), IFISC, jramasco@ifisc.uib-csic.es
- Prof. David Sánchez (PhD supervisor), IFISC, david.sanchez@uib.es
- Dr. Márton Karsai (collaborator), CEU DNDS, karsaim@ceu.edu
- Dr. Riccardo Gallotti (head of lab), CHuB Lab, FBK, rgallotti@fbk.eu