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

Mathematics department, Universidad Carlos III de Madrid, 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.

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.

Publications

1. Orsanigo, V. **et al.** The Geography of Interest in International Conversations on Twitter. **EPJ Data Science** (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. **Scripta manent. Historia del español, documentación archivística y humanidades digitales** (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.

Talks

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

Supervision and teaching

- Taught *Foundations of Algorithms in Python* for the MSc in Data Science, University of Trento, in July every year since 2024 (18 hours, 3 ECTS each). Course openly available as interactive Jupyter notebooks published as a website: tlouf.github.io/Py4DataSci-course.
- 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-supervises 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

- 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).

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.

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