Blas Kolic

Postdoc (Maths, Networks, ML)

- ▶ Current: Universidad Carlos III de Madrid, Spain
- ▶ PhD: University of Oxford, UK
- ▶ BsC: UNAM, México

Contact

- 📍 Calle Madrid 126, Building 18.2.D.19, uc3m, Getafe, Spain
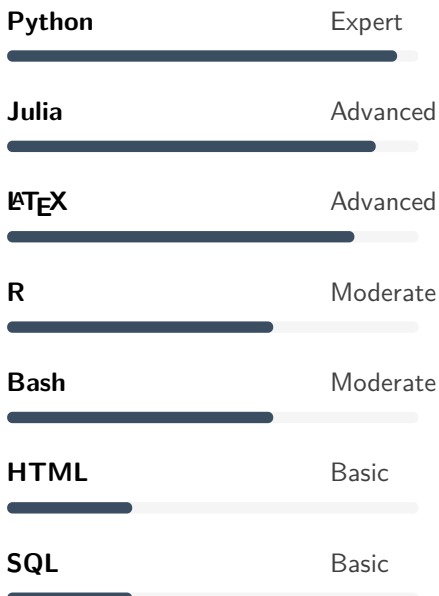- 📱 +34 603 02 1873
- ✉ blas.kolic@uc3m.es
- 🌐 IMDEA Networks website
- ⦿ github.com/blas-ko
- 🐦 Blas_Ko

Programming Skills

Python — Expert

Julia — Advanced

LaTeX — Advanced

R — Moderate

Bash — Moderate

HTML — Basic

SQL — Basic

Research & Studies

Postdoctoral research fellow, Universidad Carlos III de Madrid
UC3M-Santander Big Data Institute (IBiDat)

Nov 2024 - PRESENT

Postdoctoral research fellow, IMDEA Networks
Working mainly for UC3M-Santander Big Data Institute (IBiDat)

Nov 2022 - Mar 2024

DPhil in Mathematics, University of Oxford
Mathematical Institute. Oxford, UK
Complexity Economics at the Institute for New Economic Thinking of the Oxford Martin School

Sep 2018 - Oct 2022

Thesis: *Data-driven methods for complex social systems: social media, data connect* (2022) under supervision of Prof. Doyne Farmer and Prof. Cameron Hepburn
Available here.

BSC Physics, Universidad Nacional Autónoma de México
Faculty of Sciences. Mexico City, Mexico
GPA: 9.25/10, First Class

Aug 2011 - Apr 2018

Thesis: *Transporte de Jets: Aplicación al sistema restringido de tres cuerpos* (2018) under supervision of Prof. Luis Benet.
Available here.

Professional experience

Data Analytics and Tools.
The World Bank Group (WBG), USA

Apr 2022 - PRESENT

Short-term consultant. Big data analysis of social networks, focusing on clustering social networks to run randomized controlled trials to reduce hate speech online.

Data Analyst
Pondera Lab, Mexico

Jul 2016 - Sep 2017

Machine learning, econometric and statistical modeling, geospatial data analysis, web-scraping, portfolio theory, basic web design (HTML) and model integration (Django + Python)

Languagues

Spanish Native

English Expert

Software

 TaylorSeries.jl (contributor)

 MexiCovid19 (website & project)

 LatentStateInitialization (paper code)

 Twitter chambers (paper code)

 Music recommendation system (Machine learning Kaggle project)

Interests

▸ Networks
▸ Dynamical systems
▸ Complex systems
▸ Agent-based modelling
▸ Big data & statistics
▸ Social & behavioural science
▸ Statistical physics
▸ Music

Publications & preprints

- **Kolic B.**, Cebrian M., Ukar I. & Lillo R.E. (2025). Incentivized network dynamics in digital job recruitment. *Journal of Complex Networks*, 13(6), cnaf047 (link, arxiv)
- **Kolic, B.**, Monti, C., Morales, G. D. F., & Pangallo, M. (2025). Comparing Data Assimilation and Likelihood-Based Inference on Latent State Estimation in Agent-Based Models. *arXiv preprint arXiv:2509.17625.* (under review) (link)
- **Kolic B.**, Aguirre-López F., et al. (2025). From chambers to echo chambers: quantifying polarization with a second-neighbor approach applied to Twitter's climate discussion. *Journal of Complex Networks*, 13(4), cnaf020. (link, arxiv)
- **Kolic, B.**, Sabuco, J. & Farmer, J.D. (2022). Estimating initial conditions for dynamical systems with incomplete information. *Nonlinear Dynamics.* (link)
- **Kolic B.**, Rodríguez-Cervantes M.T., Padilla P. & Knights F. (2022). Rhythm and form in music: a complex systems approach. *arXiv preprint: 2207.03602.* (link)
- Dyer, J., & **Kolic, B**. (2020). Public risk perception and emotion on Twitter during the Covid-19 pandemic. *Applied Network Science*, 5(1), 1-32. (link)

Ongoing research

- **Kolic B.** & Farmer J.D. (2025). Dynamic latent states estimation in agent-based models with network interactions using data assimilation. (*in preparation*).
- Jahani E., **Kolic B.**, Tonneau M., Barkoczi D., Malhotra N., Orozco V., & Fraiberger S (2025). As Pro-social Messaging Reduces Engagement, the Platform Substitutes the Downstream Effects. (*in preparation*).
- Benítez-Peña S, **Kolic B.**, Menéndez V., & Pulido Belén (2025). Trade-offs Between Individual and Group Fairness in Machine Learning: A Comprehensive Review. (*in preparation*).

Selected conferences & schools

- **International Conference on Complex Networks and their Applications (CNA24, Turkey)** (November, 2024) Oral presentation: *Incentivized network dynamics in digital job recruitment*
- **International Conference on Complex Networks and their Applications (CNA23, France)** (November, 2023) Oral presentation: *Incentivized network dynamics in digital job recruitment*
- **International Conference on Computational Social Science (IC2S2, Denmark)** (July, 2023) Oral presentation: *Network interventions to reduce hate speech on Nigerian Twitter*
- **Conference for Complex Systems (CCS22, Spain)** (October, 2022) Oral presentation: *Structure of polarized discussions with unsupervised methods: the Twitter climate change conversation*
- **ICML workshop: Artificial inteligence for agent-based models (AI4ABM, USA)** (July, 2022) Keynote speaker: *Latent states estimation for agent-based models using data assimilation*
- **Workshop for economic heterogenous interacting agents (WEHIA22, Italy)** (June, 2022) Oral presentation: *Latent states estimation for models with network topologies using data assimilation*

- **Conference for Complex Networks & their Applications (CCN21, Spain)** (November, 2021) Poster presentation: *The complexity of the Twitter conversation on climate change*

- **Conference for Complex Systems (CCS21, France)** (October, 2021) Oral Presentations: 1) *Latent state estimation using localised ensemble Kalman filters.* 2) *Rhythm and form in music: A complex systems approach*

- **Machine Learning and Data Assimilation for Dynamical Systems (MLDADS2021, Online).** (June, 2021). Oral Presentation: *Macro to micro & back: Microstates initialization from chaotic aggregate time series.* Available at https://www.youtube.com/watch?v=7YXnO1pYsGM

- **Conference for Complex Systems (CCS20, Online).** (December, 2020) Oral Presentation: *Public risk perception and emotion on Twitter during the Covid-19 pandemic.* Available at https://youtu.be/juRUmZaIAkM?t=3082

Research internships

- **Summer research Intern, Institute National de la Recherche Scientifique.** Montreal, Canada. (May 2015 - August 2015). Project: *Development of a Smartphone-Based Acoustic Environment Tracker for Speech Enhancement Applications* under supervision of Prof. Thiago Falk. Fully funded.

- **Summer research Intern, Centro de Nanociencias y Nanotecnologías.** Baja California, Mexico. (June 2014 - July 2014). Project: *Superficial composition of materials under the XPS method* under supervision of Prof. Leonel Cota Araiza. Fully funded.

Teaching experience

- **PhD in Social Science, Universidad Carlos III de Madrid**
    - **Methods Workshop: Network analysis in Python.** 4Q, 2025. Main teacher
- **Masters in Computational Social Science, Universidad Carlos III de Madrid**
    - **Social Network Analysis.** 2Q, 2025. Main Teacher
    - **Social Network Analysis.** 2Q, 2024. Main Teacher
- **Mathematical Institute, University of Oxford.**
    - **Information Theory.** Hilary term, 2022. Teaching Assistant
    - **Information Theory.** Hilary term, 2021. Teaching Assistant
    - **Networks.** Hilary term, 2021. Tutor
    - **Networks.** Hilary term, 2020. Teaching Assistant
- **Oxford Royale Academy.** Physics teacher. Summer, 2019

- **Private tutoring. Physics & Mathematics.** 2011 - 2018

Awards and Funding

- **Catedra AImpulsa.** Post-doctoral funding. 2024–2026

- **ECMI 2021 Students Competition.** First place. September 2021. Covid-19 data-driven epidemic modelling to test policies and vaccination campaigns in different countries (announcement here.)

- **Smith Award.** Doctoral Scholarship. 2021-2022
- **CONACyT-SENER.** Doctoral Scholarship. 2018-2021
- **Mitacs Gloabalink.** Summer Scholarship. Summer 2015

Curriculum Vitae, 2nd December 2025

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