Robert Jankowski

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EDUCATION

2021 – now **PhD in Network Geometry**
Departament de Física de la Matèria Condensada, Universitat de Barcelona, Spain
Thesis: *Mapping complex networks in low-dimensional hyperbolic spaces*
Supervisors: Profs. M. Ángeles Serrano and Marián Boguñá

Aug 2025 **IAIFI PhD Summer School and Summer Workshop**
Institute for Artificial Intelligence and Fundamental Interactions, Harvard University, USA

May 2025 **Complementarity in Complex Networks Workshop**
Delft, the Netherlands

Aug-Dec 2024 **Research stay with AccelNet-MultiNet program**
Luddy Artificial Intelligence Center, Indiana University, Bloomington, USA
Supervisor: Prof. Santo Fortunato

Jul 2024 **LOGML (London Geometry and Machine Learning) Summer School**
London, United Kingdom

Aug 2023 **Visualizing Complexity Science Workshop**
Complexity Science Hub, Vienna, Austria

Jul 2023 **XI GEFENOL Summer School on Statistical Physics of Complex Systems**
Barcelona, Spain

May 2022 **Complex networks: Theory, Methods, and Applications Summer School**
Lake Como School of Advanced Studies, Como, Italy

2020 – 2021 **Master's Degree in Data Exploration and Interdisciplinary Modeling**
Faculty Of Physics, Warsaw University of Technology
Thesis: *Interactions in signed complex networks* (Summa Cum Laude).
Supervisor: Dr Piotr Górski

2016 – 2020 **Bachelor's Degree in Applied Physics, Computational Physics**
Faculty of Physics, Warsaw University of Technology
Thesis: *Predicting election polls results using machine learning tools* (Summa Cum Laude),
Supervisor: Dr Julian Sienkiewicz

PUBLICATIONS

- Jankowski, R., Radicchi, F., Serrano, M., Boguñá, M., & Fortunato, S. *Task complexity shapes internal representations and robustness in neural networks*. arXiv:2508.05463, under review (2025)
- Jankowski, R., Aliakbarisani, R., Serrano, M. Á., & Boguñá, M. *Mapping bipartite networks into multidimensional hyperbolic spaces*. arXiv:2503.04316, under review (2025)
- Aliakbarisani, R., Jankowski, R., Serrano, M. Á., & Boguñá, M. *Hyperbolic Benchmarking Unveils Network Topology-Feature Relationship in GNN Performance*. arXiv:2406.02772, under review (2024)
- Jankowski, R., Hozhabrierdi, P., Boguñá, M., & Serrano, M. Á. *Feature-aware ultra-low dimensional reduction of real networks*. npj Complexity 1 (1), 13 (2024).
- Jankowski, R., Allard, A., Boguñá, M.,& Serrano, M. *The D-Mercator method for the multidimensional hyperbolic embedding of real networks*. Nat Commun 14, 7585 (2023).
- Jankowski, R.; Chmiel, A. *Role of Time Scales in the Coupled Epidemic-Opinion Dynamics on Multiplex Networks*. Entropy, 24, 105 (2022).
- Jankowski, R., Sienkiewicz, J. (2020). *Determining Crucial Factors for the Popularity of Scientific Articles*. Acta Phys Pol A 138(1), 41-47 (2020).

PRESENTATIONS AND POSTERS

Invited talks

- *Network geometry and multidimensional hyperbolic maps of real networks*, Faculty of Physics, Warsaw University of Technology, Poland, 2024

Contributed talks

- *Task complexity shapes internal representations and robustness in neural networks*, IAIFI PhD Summer School, Boston, United States, 2025
- *Mapping bipartite networks into multidimensional hyperbolic spaces*, NetSci-2025, Maastricht, the Netherlands, 2025
- *Feature-aware ultra-low dimensional reduction of real networks*, NetSci-2024, Quebec City, Canada, 2024
- *The $\mathcal{D}$-Mercator method for the multidimensional hyperbolic embedding of real networks*, American Physical Society's (APS) March Meeting, Minneapolis, United States, 2024
- *The $\mathcal{D}$-Mercator method for the multidimensional hyperbolic embedding of real networks*, 2nd Meeting of the Spanish Chapter of the Complex Systems Society, Barcelona, Spain, 2024
- *$\mathcal{D}$-Mercator: multidimensional hyperbolic embedding of real networks*, Statphys28, Tokyo, Japan, 2023
- *$\mathcal{D}$-Mercator: multidimensional hyperbolic embedding of real networks*, NetSci 2023, Vienna, Austria, 2023
- *$\mathcal{D}$-Mercator: Network embedding into ultra low-dimensional hyperbolic spaces*, CCS 2022, Palma de Mallorca, Spain, 2022
- *Role of time scales in coupled epidemic-opinion dynamics on multiplex networks*, NetSci-X 2022, virtual/Porto, Portugal, 2022
- *The influence of relations in forming interactions among communities on social websites*, SFINKS conference (award for the best student presentation), virtual, 2021
- *Crucial factors determining the popularity of scientific articles*, 10th Polish Symposium on Physics in Economy and Social Sciences, Świerk, Poland, 2019

Posters

- *Task complexity shapes internal representations and robustness in neural networks*, IAIFI Summer Workshop, Boston, United States, 2025
- *Feature-aware ultra-low dimensional reduction of real networks*, 3rd Meeting of the Spanish Society of Complex Systems, Madrid, Spain, 2025
- *$\mathcal{D}$-Mercator: multidimensional hyperbolic embedding of real networks*, XXIV Congreso de Física Estadística, Pamplona, Spain, 2023
- *Generating interactions for friendship networks*, Piotr Górski, Robert Jankowski, Giacomo Vaccario, Georges Andres and Janusz Hołyst, NetSci 2023, Vienna, Austria, 2023
- *From relation to interactions: a case study in Reddit website*, 11th Polish Symposium on Physics in Economy and Social Sciences, virtual, 2021

ART EXHIBITIONS

- Capillary Network, at Ars Electronica Festival 2025, Linz, Austria
- Altering Nature: Exploring Life in Computational Art, *Capillary Network*, at The Hong Kong University of Science and Technology (Guangzhou), China, April 2025

WORK EXPERIENCE

Jul 2021 – Aug 2021

Research Intern

Samsung R&D Institute Poland

Working in the Bixby team, focusing on Automatic Speech Recognition.
Technologies: *Python, Docker, bash*

May 2021 – Dec 2021

Student researcher

Working in Dr Anna Chmiel's group at Warsaw University of Technology on a research grant "Modeling epidemic spread using comorbidities and social attitudes".

Nov 2020 – Nov 2021

Student researcher

Working in Prof. Janusz Hołyst's group of Physics in Economy and Social Sciences at Warsaw University of Technology in project ALPHORN "Signed Relations and Structural Balance in Complex Systems: From Data to Models" (collaboration with Chair of Systems Design, ETH Zurich).

Jul 2020 – Sep 2020

Research Intern

Samsung R&D Institute Poland
Developing and testing deep learning models for named entity recognition task.
Technologies: *Python, bash, Docker, Java*.

Jul 2019 – Nov 2019

Scala Intern & Junior Scala Developer

TouK sp. z o.o. s.k.a.
Technologies: *Scala, Akka, Python, Docker, RabbitMQ*

Jul 2018 – Aug 2018

Software Engineering Intern

Ilabo Sp. z o.o., Warsaw
Software development in web technologies (C#, .NET Core). Data analysis (Python).

REVIEWING ACTIVITIES

Program Committee: International School and Conference on Network Science, NetSci (2024, 2025), ACM KDD 2024, 4th Multidisciplinary International Symposium on Disinformation in Open Online Media 2022 (MISDOOM 2022)

Scientific Journals: Physical Review E, Communications Physics, Chaos: An Interdisciplinary Journal of Nonlinear Science, Scientific Reports, PLOS ONE, Physica A: Statistical Mechanics and its Applications, Proceedings of the Royal Society A

ORGANIZING ACTIVITY

- Network Geometry: Theory and Applications, satellite at NetSci 2025, Maastricht, the Netherlands
- Teaching Fellow, DIS master class: Network Renormalization at Complexity Science Hub, Vienna, Austria, May 2025
- Network Geometry: Theory and Applications, satellite at NetSci 2024, Quebec, Canada
- Workshop about complex networks "Xarxes complexes" at the X Festa de la Ciència(Science Days) at University of Barcelona, May, 2024
- Workshop about networks "Les xarxes complexes com a eina per resoldre problemes" at the IX Festa de la Ciència(Science Days) at University of Barcelona, May, 2023

FUNDINGS AND AWARDS

Grants

- External collaborator in the grant YOUNG PW II titled "Application of the low-dimensional representation of real networks for localization of information source" with Robert Paluch awarded by Warsaw University of Technology (2024-2026) (150 000 PLN)
- Bridge grant with Lluc Bono Rosselló awarded by Young Researchers of the Complex Systems Society (yrCSS) (2024)

Individual funding

- AccelNet-MultiNet program (2024)
- Predoctoral grant FI-SDUR (2022-2025)
- Scholarships for Events on Complex Systems (SECS) awarded by Young Researchers of the Complex Systems Society (yrCSS) (2022)

Awards

- Best engineering thesis in Poland awarded by Section Physics in Economy and Social Sciences of Polish Physical Society (07.2021).
- Rector's scholarship for academic performance in 2020 (3rd/317), 2019 (top 5), and 2018.

LANGUAGES

English — professional working proficiency (C1 Advanced certificate)
Spanish — limited working proficiency
Polish — native