

CELIA RUBIO-MADRIGAL

 celrm.github.io

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I am a PhD candidate at CISPA, where I study challenges in graph learning regarding the dual role of graphs as data and computation structures. I hold degrees in Mathematics and Computer Science from Universidad Complutense de Madrid, and a "la Caixa" Foundation Fellowship that funded my master's at Strathclyde, where I earned the Best Overall Prize. I am also part of IT for the European Girls' Mathematical Olympiad every year.

EXPERIENCE



Doctoral researcher • *CISPA Helmholtz Center for Information Security* 2023-now

– Relational Machine Learning Lab.  – Supervisor: Dr. Rebekka Burkholz 



TA: Laboratory demonstrator (7h/week) • *University of Strathclyde* 2023

– "CS310 Foundations of AI" for Year 3 BSc Computer Science. – Supervisor: Dr. Andrew Abel 

Grant: Departmental collaboration • *Ministerio de Educación & Universidad Complutense de Madrid* 2021-22

– Identification of Boolean functions that need big circuits.  – Supervisor: Dr. Ismael Rodríguez Laguna 

Grant: Introduction to research ICMAT-Severo Ochoa • *Instituto de Ciencias Matemáticas (ICMAT)* 2021

– Differential geometry methods in ML applications.  – Supervisor: Dr. David Martín de Diego 

Consultant Developer Intern (10 weeks) • *Guidewire Software* 2021


– Design of an intelligent search engine for internal raised issues.

EDUCATION



PhD in Computer Science • *Universität des Saarlandes (Saarbrücken, Germany)* 2023-now

MSc in Advanced CS with AI • *University of Strathclyde (Glasgow, UK)* – 8.57/10 (with Distinction) 2022-23

– Fully funded by "la Caixa" Foundation Fellowship.  – Earned the Department's Best Overall Prize.

BSc in Mathematics • *Universidad Complutense de Madrid (Spain)* – 9.08/10 2017-22

BSc in Computer Science • *Universidad Complutense de Madrid (Spain)* – 9.16/10 2017-22

Professional Music Degree in Baroque Recorder • *Conservatorio Profesional de Música Arturo Soria* 2006-16








PUBLICATIONS



Legend: ★ First author at A* conference (NeurIPS, ICLR, ICML). – Preprint. * Equal contribution.



– HAM: A hyperbolic step to regulate implicit bias. T. Jacobs, A. Gadhikar, C.R.M., R. Burkholz. arXiv, 2025. 

– When shift happens-Confounding is to blame. A.G. Reddy, C.R.M., R. Burkholz, K. Muandet. arXiv, 2025. 

- ★ GNNs getting ComFy: Community and feature similarity guided rewiring. C.R.M.*, A. Jamadandi*, R. Burkholz. 13th International Conference on Learning Representations (ICLR), 2025. 
- ★ Spectral graph pruning against over-squashing and over-smoothing. A. Jamadandi*, C.R.M.*, R. Burkholz. 38th Conference on Neural Information Processing Systems (NeurIPS), 2024. 
- Rendering string diagrams recursively. C.R.M., J. Hedges. arXiv, 2024. 
- Serialismo y matemáticas (I)  (II)  (III)  (IV) . C.R.M. DivulgaMAT: Música y Matemáticas, 2019.

TALKS



- Lightning talk: Workshop on Geometry, Topology, and ML (GTML): *Leipzig, Germany* **Nov 2025**
-  Poster pitch talks (2): Workshop on Mining and Learning with Graphs (MLG): *Porto, Portugal* **Sep 2025**
-  Lightning talk: International Conference on Network Science (NetSci): *Maastricht, Netherlands* **Jun 2025**
-  Invited talk & visit: Seminar of the TUWien ML Research Unit: *Vienna, Austria* **May 2025**
-  Online talk: Cohere Labs / Cohere For AI - Open Science Community:  **Feb 2025**
-  Contributed talk: Helmholtz AI Conference: AI for Science (HAICON): *Düsseldorf, Germany* **Jun 2024**



AWARDS






Postgraduate

- Best Overall Performance Prize: *University of Strathclyde's top student in MSc Advanced CS* **Oct 2023**
-  Nova III Student List: *Spain's top 10 talents under 25 in Computer Science* **Mar 2023**
- 9th Heidelberg Laureate Forum, with interviews:  HLFF Spotlight,  Tribuna Complutense **Sep 2022**
-  "la Caixa" Foundation Fellowship, with interviews:  El País,  El Plural,  TeleMadrid **Jun 2022**

Undergraduate

-  Aula de Verano "Blas Cabrera" for Spain's top undergrads: *Intl. Univ. Menéndez Pelayo (UIMP)* **2022**
-  SWERC contestant (competitive programming): *ICPC Southwestern Europe Regional Contest in Italy* **2022**
- Becas de Excelencia: *Excellence Grants for undergrads with >9/10 in Madrid (2100€)* **2018-22**

Pre-undergraduate

-  EGMO contestant representing Spain: *European Girls' Mathematical Olympiad in Switzerland* **2017**
-  Premio Extraordinario de Bachillerato: *Madrid's top 25 in general-content exam (1000€)* **2017**
-  Leading Program "la Caixa": *Madrid's top 20 university admission scores* **2017**
- 10/10 with Honours at IES San Mateo: *Top 5 students at Spain's only public High School of Excellence* **2017**
- ESTALMAT: *2-year mathematics talent program for 25 high school students in Madrid* **2012-14**

SERVICE



Academic service • *Conferences and workshops*

- Program Committee and reviewer for Workshop on Mining and Learning with Graphs (MLG) 2025.

Mathematical Olympiad service • *Organizational support at international events*

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- IT at European Girls' Mathematical Olympiad (EGMO) with Joseph Samuel Myers
- Deputy Leader of Spain at EGMO 2022 and PAGMO 2021.
- Jury at the local phases of 57th to 61st Olimpiada Matemática Española (OME) Madrid.
- Guide at the Iberoamerican Mathematical Olympiad 2018.

2023-now

Student representation • *Facultad de Informática, Universidad Complutense de Madrid*

2020-22

- Secretary of the Student Council 2021-22, and member of the Faculty Board 2020-22.

Open-source contribution • *LaTeX package: ddphonism*

2019

- Generates 12-tone music diagrams with TikZ; included in MiKTeX and TeXLive.

Outreach in mathematics • *Videos for the Spanish math education community*

2018-21

- Olympic role models, Science is written with an A, speech at 20th anniversary of ESTALMAT.

SUPERVISION



Master's and Bachelor's thesis supervision • *CISPA & Universität des Saarlandes*

2024-now

- Adarsh Jamadandi: On the importance of graph-task alignment for graph neural networks (Master's 2024).
- Chinmay Joshi: The effects of data pruning on memorization (Master's TBD).

LANGUAGES



Spanish • Native

English • TOEFL iBT 110/120 (2021)

German • Goethe-Zertifikat B1 (2017)

