

Ana Laura Trujillo Negrete

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ACADEMIC DEVELOPMENT

Postdoctoral Research

University of Chile, Center for Mathematical Modeling (CMM)

Postdoctoral Research Fellowship (CMM Funding)

Period: April 2025 – October 2025

Area: Graph Theory and Discrete Mathematics

University of Chile, Center for Mathematical Modeling (CMM)

Postdoctoral Research Fellowship (ANID/Fondecyt)

Period: April 2022 – April 2025

Area: Graph Theory and Discrete Mathematics

Cinvestav, Department of Mathematics

Postdoctoral Research Fellowship (Conacyt)

Period: December 2021 – April 2022

Area: Graph Theory and Discrete Mathematics

Graduate Studies

Ph.D. in Mathematics

Institution: Cinvestav, Department of Mathematics

Period: 2017 – 2021

Defense Date: August 2021

Thesis: *Reconstruction and automorphisms of token graphs*

Supervisor: Ruy Fabila Monroy

M.Sc. in Mathematics

Institution: Universidad Autónoma de Zacatecas, Unidad Académica de Matemáticas

Period: 2015 – 2016

Defense Date: January 2017

Thesis: *Estimación de algunos parámetros combinatorios de las gráficas de fichas*

Supervisors: Jesús Leaños Macías and Érika B. Roldán Roa

Undergraduate Studies

B.Sc. in Applied Mathematics

Institution: Universidad Juárez del Estado de Durango, Facultad de Ciencias Exactas

Period: 2011 – 2015

Year of Completion: 2015

Thesis: *Una propiedad estructural de los dibujos rectilíneos óptimos en cruces de las gráficas completas*

Supervisors: Jesús Leaños Macías and Érika B. Roldán Roa

ACADEMIC EMPLOYMENT

Lecturer

Institution: University of Chile, Faculty of Physical and Mathematical Sciences

Period: March 2025 – July 2025 (ongoing)

Lecturer

Institution: University of Chile, Faculty of Physical and Mathematical Sciences

Period: August 2023 – January 2024

Lecturer

Institution: Benemérita y Centenaria Escuela Normal del Estado de Durango

Period: August 2021 – December 2021

RESEARCH

Areas of Interest

- **Discrete Mathematics:** Investigation of rainbow and monochromatic structures in graphs, hypergraphs, and arithmetic settings, inspired by Ramsey-type problems.
- **Graph Theory:** Exploration of structural and combinatorial properties of graphs, such as connectivity, Hamiltonicity, treewidth, colorings, and domination, as well as the study of digraphs and hypergraphs.
- **Extremal Graph Theory:** Study of embedding problems and covering structures, including colored configurations in graphs and hypergraphs, with an emphasis on extremal conditions.
- **Spectral Graph Theory:** Study of spectral properties of graphs and their applications to structural and combinatorial analysis.

Publications in Mathematics

Published or Accepted Articles

- [1] Fabila-Monroy, R., Gómez-Galicia, S. G., Hernández-Cruz, C., Trujillo-Negrete, A. L. (2024). On the treewidth of token and Johnson graphs. arXiv preprint: [arXiv:2402.17962](https://arxiv.org/abs/2402.17962). Accepted for publication in *Discrete Applied Mathematics*.
- [2] Stein, M., Trujillo-Negrete, A. (2025). Antidirected trees in dense digraphs. *SIAM Journal on Discrete Mathematics*, 39 (2), 698-727. <https://doi.org/10.1137/24M165497X>.
- [3] Fabila-Monroy, R., Trujillo-Negrete, A. L. (2025). On the automorphism group of token graphs of complete bipartite graphs. arXiv preprint: [arXiv:2302.07914](https://arxiv.org/abs/2302.07914). Accepted for publication in *Boletín de la Sociedad Matemática Mexicana*.
- [4] Fabila-Monroy, R., Leaños, J., and Trujillo-Negrete, A. L. (2022). On the connectivity of token graphs of trees. *Discrete Mathematics & Theoretical Computer Science*, 24(1). <https://dmtcs.episciences.org/9247>.
- [5] Adame, L. E., Rivera, L. M., and Trujillo-Negrete, A. L. (2021). Hamiltonicity of token graphs of some join graphs. *Symmetry*, 13(6), 1076. <https://doi.org/10.3390/sym13061076>.
- [6] Dalfó, C., Duque, F., Fabila-Monroy, R., Fiol, M. A., Huemer, C., Trujillo-Negrete, A. L., and Zaragoza Martínez, F. J. (2021). On the Laplacian spectra of token graphs. *Linear Algebra and its Applications*, 625, 322-348. <https://doi.org/10.1016/j.laa.2021.05.005>.
- [7] Fabila-Monroy, R., Perz, D., and Trujillo-Negrete, A. L. (2021). Empty rainbow triangles in k -colored point sets. *Computational Geometry*, 95, 101731. <https://doi.org/10.1016/j.comgeo.2020.101731>.
- [8] Rivera, L. M., and Trujillo-Negrete, A. L. (2021). Hamiltonicity of the complete double vertex graph of some join graphs. *Matemática Contemporânea*, 48, 146-155. <http://doi.org/10.21711/231766362021/rmc4815>.

- [9] Leños, J., and Trujillo-Negrete, A. L. (2018). The connectivity of token graphs. *Graphs and Combinatorics*, 34(4), 777-790. <https://doi.org/10.1007/s00373-018-1913-9>.
- [10] Rivera, L. M., and Trujillo-Negrete, A. L. (2018). Hamiltonicity of token graphs of fan graphs. *The Art of Discrete and Applied Mathematics*, 1(1), #1.07. <https://doi.org/10.26493/2590-9770.1244.720>.

Preprints (submitted)

- [11] Kontogeorgiou, G., Pavez-Signé, M., Stein, M., Taruni, S., Trujillo-Negrete, A. (2025). Separating edges by linearly many subdivisions. arXiv preprint: [arXiv:2506.14011](https://arxiv.org/abs/2506.14011).
- [12] Penev, I., Taruni, S., Thomassé, S., Trujillo-Negrete, A., Tyomkyn, M. (2025) Two-block paths in oriented graphs of large semidegree. arXiv preprint: [arXiv:2503.23191](https://arxiv.org/abs/2503.23191).
- [13] Stein, M., Trujillo-Negrete, A. (2024). Embedding Oriented Trees into Digraphs without Oriented 4-cycles. arXiv preprint: [arXiv:2411.13483](https://arxiv.org/abs/2411.13483).
- [14] Fernandes, C. G., Lintzmayer, C. N., Peña, J. P., Santos, G., Trujillo-Negrete, A., Zamora, J. (2024). A study on token digraphs. arXiv preprint: [arXiv:2410.20189](https://arxiv.org/abs/2410.20189).
- [15] Fabila-Monroy, R., Gómez-Galicia, S. G., Gregorio-Longino, D., Hoekstra-Mendoza, T., Trujillo-Negrete, A. (2024). On the automorphisms of token graphs generated by 2-cuts with the same neighbors. arXiv preprint: [arXiv:2408.04059](https://arxiv.org/abs/2408.04059).
- [16] Fabila-Monroy, R., Trujillo-Negrete, A. L. (2022). Connected (C_4 , Diamond)-free graphs are uniquely reconstructible from their token graphs. arXiv preprint: [arXiv:2207.12336](https://arxiv.org/abs/2207.12336).

Presentations at Colloquia, Conferences, etc.

Invited Talks

- | | |
|---|---------------|
| 1) The Tree Embedding Problem: From Edge-Density to Semidegree Conditions
35º Colóquio Brasileiro de Matemática | July 2025 |
| 2) El problema del encaje de árboles en dígrafos
XXXVII Jornada de Matemática de la Zona Sur | April 2025 |
| 3) On the Treewidth of Token Graphs
VII Congreso Latinoamericano y del Caribe de Matemática | August 2024 |
| 4) El problema del encaje de árboles para dígrafos
Universidad de Valparaíso | April 2024 |
| 5) El Problema de reconstrucción de los grafos de fichas
XXXI Congreso de Matemática Capricornio, Universidad Católica del Norte, Chile | August 2023 |
| 6) El espectro Laplaciano de las gráficas de fichas
55 Congreso Nacional de la Sociedad Matemática Mexicana | October 2022 |
| 7) Reconstruyendo gráficas de fichas, ¿de manera única?
3er Encuentro de Mujeres Matemáticas Mexicanas | November 2021 |
| 8) Laplacian Spectrum of Token Graphs
Computational Geometry Seminar, Universitat Politècnica de Catalunya (online) | May 2021 |
| 9) Gráficas de Fichas y sus Aplicaciones
Seminario de Teoría de Gráficas y sus Aplicaciones, UAM Cuajimalpa (online) | May 2021 |

Other Presentations

- | | |
|--|----------------|
| 10) The Tree Embedding Problem
Noon Seminar, Charles University | February 2025 |
| 11) Reconstruction of Token Graphs
LIMDA Seminar, Universitat Politècnica de Catalunya | February 2024 |
| 12) Reconstrucción de los grafos de fichas
Jornada Matemática de la Zona Sur, Universidad de Concepción, Chile | April 2023 |
| 13) Reconstruction of Token Graphs
AGCO Seminar, Center for Mathematical Modeling, University of Chile | October 2022 |
| 14) El problema de reconstrucción de las gráficas de fichas
54 Congreso Nacional de la Sociedad Matemática Mexicana | October 2021 |
| 15) El problema de reconstrucción de las gráficas de fichas
Graph Theory Seminar, Center for Mathematical Modeling, University of Chile (online) | September 2021 |
| 16) Espectro Laplaciano de las gráficas de fichas
XXXVI Coloquio Víctor Neumann-Lara (online) | March 2021 |
| 17) Laplacian Spectrum of Token Graphs
Combinatexas 2021 (online) | February 2021 |
| 18) Reconstrucción y grupo de automorfismos de gráficas de fichas
XXXV Coloquio Víctor Neumann-Lara | March 2020 |

Research Visits

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|---|---------------|
| 1) Charles University (Prague, Czech Republic)
Research topic: Embedding of oriented structures in digraphs
Host: Irena Penev | February 2025 |
| 2) Universitat Politècnica de Catalunya (Barcelona, Spain)
Research topic: Rainbow structures in the plane
Host: Oriol Serra | February 2024 |
| 3) Cinvestav (Mexico City, Mexico)
Research topic: Algebraic and structural properties of token graphs
Host: Ruy Fabila Monroy | January 2023 |
| 4) Universidad Autónoma de Zacatecas (Zacatecas, Mexico)
Research topic: Connectivity and hamiltonicity of token graphs
Host: Jesús Leños Macías | March 2019 |

Workshops

- 1) **2nd Graph Theory in the Andes Workshop**
Cajón del Maipo, Chile, March 2024 (Invited)
<https://eventos.cmm.uchile.cl/gta2024/>
- 2) **3º Workshop Chileno Paulista em/en Grafos**
São Paulo, Brasil, September 2022 (Invited)
<http://professor.ufabc.edu.br/~carla.negri/chipagra/2022/index.html>
- 3) **3rd Reunion of Optimization, Mathematics and Algorithms (ROMA)**
CDMX, México, August 2019 (Invited)
<http://academicos.azc.uam.mx/heredia/ROMA/2019/>
- 4) **Workshop “Algunos problemas sobre gráficas de fichas”**
Escuela de Verano UAZ-SPAUAZ. Zacatecas, México, June 2019

- 5) **Reunion of Optimization, Mathematics and Algorithms (ROMA)**
CDMX, México, July 2017
<http://academicos.azc.uam.mx/heredia/ROMA/2017/>
- 6) **IV Workshop on Discrete Mathematics**
Querétaro, México, June 2017 (Project assistant)

TEACHING

Undergraduate Courses Taught

- **Introducción al Álgebra** (ongoing) March – July 2025
Departamento de Ingeniería Matemática, Universidad de Chile
- **Introducción al Álgebra** August – December 2023
Departamento de Ingeniería Matemática, Universidad de Chile
- **Estadística Inferencial** August – December 2021
Licenciatura en Enseñanza y Aprendizaje de las Matemáticas, Bycened
- **Pensamiento Estocástico** August – December 2021
Licenciatura en Enseñanza y Aprendizaje de las Matemáticas, Bycened
- **Sentido Numérico** August – December 2021
Licenciatura en Enseñanza y Aprendizaje de las Matemáticas, Bycened

Supervision of Theses

- **Marine Gibaud** January 2025
Undergraduate Thesis: *On the Automorphism Group of Token Graphs of Hamming Graphs*
Principal Advisor, with Maya Stein as Co-advisor.

RELEVANT BACKGROUND

Fellowships and Awards

- **Chilean National Agency for Research and Development (ANID)** 2022-2025
Postdoctoral Fellowship
- **National Council for Science and Technology of Mexico (Conacyt)** 2017-2021
PhD Scholarship
- **National Council for Science and Technology of Mexico (Conacyt)** 2015-2016
Master's Scholarship

Organization of Scientific Events

- **Summer School in Discrete Mathematics** January 2025
Universidad Adolfo Ibáñez, Campus Viña del Mar, January 6–10, 2025

Organized the Summer School in Discrete Mathematics, a multidisciplinary event featuring specialized courses and lectures on Algorithms, Combinatorics, Discrete Mathematics, and their various applications. Responsibilities included planning and coordinating logistical and academic aspects of the event, as well as collaborating with supporting institutions: Center for Mathematical Modeling, University of Chile, Pontificia Universidad Católica de Chile, Universidad Adolfo Ibáñez, and Universidad de O'Higgins.

Equity and Gender Participation

- **Gender and Equity Committee, CMM (Member)** May 2023 – Present
Developing initiatives to promote gender equity within mathematical sciences
- **International Seminar: Gender Perspective in R&D&I** November 2023
Participant, [link to the event](#)
- **WoMaths Congress 2023** August 2023
Participant, [link to the event](#)
- **Reconstruyendo gráficas de fichas, ¿de manera única?** November 2021
Invited talk, 3er Encuentro de Mujeres Matemáticas Mexicanas, [link to the talk](#)