

JUAN CERVIÑO REMERSARO

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RESEARCH INTERESTS

The goal of my research agenda is to introduce requirements to perform machine learning over graphs. My focus has been on three main types of requirements so that next-generation intelligent systems can be: efficient under scale, robust to perturbations and flexible to heterogeneity. These three challenges motivate my research thrusts: (i) learn with large scale graphs and do it in an efficient way, (ii) learn stable solutions to perturbations on the input domain, and (iii) learn meaningful representations in the presence of heterogeneous graphs.

EMPLOYMENT **Massachusetts Institute of Technology** Cambridge, Massachusetts
Postdoctoral Researcher September 2024 - Present

Fellowship: Postdoctoral Fellowship Program for Engineering Excellence (PFPFEE)
Host: Prof. Navid Azizan

Google Research New York City, New York
Student Researcher June 2023 - December 2023

Team: Geometric AI
Hosts: Ameesh Makadia and Carlos Esteves

Fundación Julio Ricaldoni Montevideo, Uruguay
Research Assistant September 2018 - May 2019

Pensur Montevideo, Uruguay
Automation and Robotics Engineer August 2016 - July 2018

Temac Montevideo, Uruguay
Technical Sales Engineer December 2015 - July 2016

Integer Holdings Corporation (former CCC del Uruguay) Montevideo, Uruguay
Circuit Design Intern May 2015 - August 2015

EDUCATION **University of Pennsylvania** Philadelphia, Pennsylvania
Ph. D. in Electrical Engineering August 2024

Thesis: “Graph Machine Learning Under Requirements”
Advisor: Prof. Alejandro Ribeiro

Universidad de la República Montevideo, Uruguay
B. Sc. in Electrical Engineering May 2018

Project: “Oleosonic”
Advisors: Profs. Leonardo Barboni and Nicolás Pérez

ACADEMIC HONORS AND AWARDS

- Granted the MIT Postdoctoral Fellowship Program for Engineering Excellence (PFPFEE) for the 2024 – 2026 cohort.
- Named a Rising Star in Signal Processing at the International Conference on Acoustics, Speech, and Signal Processing 2023 Conference (ICASSP).
- Recipient of the Dean’s Fellowship for my graduate study towards my Ph.D. This fellowship is awarded to Electrical and Systems Engineering Ph.D. students in recognition of exceptional performance and potential for continued high achievement in graduate work.
- Recipient of the 2019 Lilian Beck Fellowship, awarded to exceptional students among the already exceptional students to whom the Electrical and Systems Engineering Department already offered the Dean’s fellowships.

PUBLICATIONS Journal papers: 4, conference papers: 15. Total citations: 146. H-index: 6. I10-index: 3.

Journal papers (working drafts/submitted/revise)

- [J4] Z. Wang, **J. Cerviño**, and A. Ribeiro, “Generalization of Geometric Graph Neural Networks,” *IEEE Trans. Signal Process.*, 2024 (under submission).
- [J3] **J. Cerviño**, H. Mostafa, M. A. Turja, N. Himayat, and A. Ribeiro, “Distributed training of large graph neural networks with variable communication rates,” *IEEE Trans. Signal and Information Process. over Networks*, 2024 (under submission).

Journal papers (published/in press)

- [J2] **J. Cerviño**, L. Ruiz, and A. Ribeiro, “Learning by Transference: Training Graph Neural Networks on Growing Graphs,” *IEEE Trans. Signal Process.*, vol. 71, pp. 233–247, 2023 [[pdf](#)].
- [J1] **J. Cerviño**, J. A. Bazerque, M. Calvo-Fullana, and A. Ribeiro, “Multi-task Reinforcement Learning in Reproducing Kernel Hilbert Spaces via Cross-learning,” *IEEE Trans. Signal Process.*, vol. 69, no. 4, pp. 5947 – 5962, 2021 [[pdf](#)].

Conference papers (preprints/submitted)

- [C15] Z. Wang, **J. Cerviño**, and A. Ribeiro, “A Manifold Perspective on the Statistical Generalization of Graph Neural Networks,” 2025, ICML (Under Submission)[[pdf](#)].
- [C14] **J. Cerviño**, N. NaderiAlizadeh, and A. Ribeiro, “Federated Representation Learning via Maximal Coding Rate Reduction,” 2022 (preprint)[[pdf](#)].
- [C13] **J. Cerviño**, H. Kumar, and A. Ribeiro, “Parameter Critic: a Model Free Variance Reduction Method Through Imperishable Samples,” 2020 (preprint)[[pdf](#)].

Conference papers

- [C12] **J. Cerviño**, S. Agarwal, V. Kumar, and A. Ribeiro, “Constrained Learning for Decentralized Multi-Objective Coverage Control,” in *Proc. IEEE Int. Conf. Robotics and Automation*, May 19-25, 2025 [[pdf](#)].
- [C11] Z. Wang, **J. Cerviño**, and A. Ribeiro, “Generalization of Graph Neural Networks is Robust to Model Mismatch,” in *AAAI Conference on Artificial Intelligence*, February 25-March 4, 2025 [[pdf](#)].
- [C10] Z. Wang, **J. Cerviño**, and A. Ribeiro, “Generalization of Geometric Graph Neural Networks,” in *Proc. Asilomar Conf. on Signals, Systems, Computers*, October 27-30, 2024.
- [C9] H. Mostafa, A. Grabowski, H. Mostafa, **J. Cerviño**, A. Ribeiro, and N. Himayat, “Fastsample: Accelerating distributed graph neural network training for billion-scale graphs,” in *Proc. Design Automation Conference*, June 23-27, 2024 [[pdf](#)].
- [C8] S. P. Patankar, M. Ouellet, **J. Cerviño**, A. Ribeiro, and a. Kieran Murphy, “Intrinsically Motivated Graph Exploration Using Network Theories of Human Curiosity,” in *Proc. Learning on Graphs*, November 27-30, 2023 [[pdf](#)].
- [C7] **J. Cerviño**, L. F. O. Chamon, B. Haeffele, R. Vidal, and A. Ribeiro, “Learning Globally Smooth Functions on Manifolds,” in *Proc. Int. Conf. on Machine Learning*, pp. 3815–3854, Honolulu, HI, USA, July 3-7, 2023 [[pdf](#)] [[code](#)].
- [C6] **J. Cerviño**, L. Ruiz, and A. Ribeiro, “Training Graph Neural Networks on Growing Stochastic Graphs,” in *Proc. Int. Conf. Acoustics, Speech, Signal Process.*, Rhodes Island, Greece, June 4-9, 2023 [[pdf](#)].
- [C5] **J. Cerviño**, J. A. Bazerque, M. Calvo-Fullana, and A. Ribeiro, “Multi-Task Bias-Variance Trade-Off Through Functional Constraints,” in *Proc. Int. Conf. Acoustics, Speech, Signal Process.*, Rhodes Island, Greece, June 4-9, 2023 [[pdf](#)].
- [C4] Z. Shen, **J. Cerviño**, H. Hassani, and A. Ribeiro, “An Agnostic Approach to Federated Learning with Class Imbalance,” in *Proc. Int. Conf. on Learning Representations*, Virtual, April 25-29, 2022 [[pdf](#)][[code](#)].

- [C3] **J. Cerviño**, L. Ruiz, and A. Ribeiro, “Training Stable Graph Neural Networks Through Constrained Learning,” in *Proc. Int. Conf. Acoustics, Speech, Signal Process.*, pp. 4223–4227, Singapore, June 5-10, 2022 [pdf].
- [C2] **J. Cerviño**, J. A. Bazerque, M. Calvo-Fullana, and A. Ribeiro, “Multi-task Supervised Learning via Cross-learning,” in *Proc. of European Signal Process. Conf.*, Virtual, August 2021 [pdf].
- [C1] **J. Cerviño**, J. A. Bazerque, M. Calvo-Fullana, and A. Ribeiro, “Meta-Learning through Coupled Optimization in Reproducing Kernel Hilbert Spaces,” in *Proc. American Control Conf.*, Philadelphia, PA, USA, July 10-12, 2019 [pdf].

Theses

- [T1] **J. Cerviño**, *Graph Machine Learning Under Requirements*. PhD thesis, University Of Pennsylvania, August 2024.

FUNDING EXPERIENCE

- Prepared quarterly reports for Distributed and Collaborative Intelligent Systems and Technology (DCIST) 2021 - 2022.

TEACHING EXPERIENCE

University of Pennsylvania

Philadelphia, PA

Teaching Assistant, Electrical and Systems Engineering

July 2019 - August 2024

- *Signal and Information Processing (ESE 224)*. University of Pennsylvania. Spring 2023 Instructor rating: TBD. Class rating: TBD. Difficulty rating: TBD. Enrollment: 65.
- *Graph Neural Networks (ESE 514)*. University of Pennsylvania. Fall 2021. Instructor rating: 3.37/4. Class rating: 3.27/4. Difficulty rating: 2.11/4. Enrollment: 44.
- *Signal and Information Processing (ESE 224)*. University of Pennsylvania. Spring 2022. Instructor rating: 2.57/4. Class rating: 2.22/4. Difficulty rating: 2.46/4. Enrollment: 56.
- *Graph Neural Networks (ESE 680)*. . University of Pennsylvania. Fall 2020. Instructor rating: 3.08/4. Class rating: 2.97/4. Difficulty rating: 2.31/4. Enrollment: 27.
- *Signal and Information Processing (ESE 224)*. University of Pennsylvania. Spring 2021. Instructor rating: 3.20/4. Class rating: 2.96/4. Difficulty rating: 2.71/4. Enrollment: 58.

Khipu Latin American Meeting in Artificial Intelligence

Montevideo, Uruguay

Teaching Assistant

March 2023

- *Graph Neural Networks*, March 7, 2023 (~ 250 students).

DIVERSITY, EQUITY, AND INCLUSION

- Invited Poster at Khipu – Latin American Meeting in Artificial Intelligence, 2023.
- Participated in the LatinX in AI workshop at the ICML 2023 conference.

SELECTED INVITED TALKS AND SEMINARS

Graph Machine Learning Under Requirements

- Computational Bioimaging Seminar, Harvard (Remote) January 24, 2024
- Laboratory for Computational Neuroimaging, Harvard (Remote) January 24, 2024

Distributed training of large graph neural networks with variable communication rates

- TILOS Seminar, (Remote) September 20, 2023

Learning Globally Smooth Functions on Manifolds

- Digital Sense, Montevideo, Uruguay March 16, 2023

- Prof. Nikolai Matni's Group Meeting, Philadelphia, PA November 2, 2022
 - ESE Ph.D. Colloquium, Philadelphia, PA November 2, 2022
- Learning by Transference: Training Graph Neural Networks on Growing Graphs**
- Graph Signal Processing Workshop, Oxford, UK June 12, 2023
 - Prof. George Pappas' Group Meeting, Philadelphia, PA October 29, 2021
 - ESE Ph.D. Colloquium, Philadelphia, PA October 15, 2021
- Training stable graph neural networks through constrained learning**
- ESE Ph.D. Colloquium, Philadelphia, PA May 13, 2022
 - Prof. George Pappas' Group Meeting, Philadelphia, PA May 6, 2022
- Parameter Critic: a Model Free Variance Reduction Method Through Imperishable Samples**
- ESE Ph.D. Colloquium, (Remote) November 11, 2020
- Meta-Learning through Coupled Optimization in Reproducing Kernel Hilbert Spaces**
- ESE Ph.D. Colloquium, Philadelphia, PA October 2, 2019

PROFESSIONAL AFFILIATIONS AND SERVICES

- Reviewer for machine learning venues: Transactions on Machine Learning Research (TMLR), NeurIPS, AAAI, ICLR, ICML and LOG.
- Reviewer for IEEE Transactions on Signal Processing, and IEEE Transactions on Image Processing.
- Regular reviewer of conference papers submitted to ICASSP, and Workshops technically sponsored by the IEEE Signal Processing Society.
- Signal Processing Society member (SPS) and IEEE student member.