

Nícolás Roque dos Santos

Postdoctoral Researcher · Department of Computer Science · University of California, Riverside

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🎓 [Nícolás Roque dos Santos](#)

Work Experience

University of California, Riverside

January 2025 - present

Postdoctoral Researcher, Supervised by Evangelos (Vagelis) Papalexakis and Elia Scudiero.

- Conducting research in methods for anomaly detection in high-resolution satellite imagery for precision agriculture.
- Creating a high-resolution geospatial dataset and developing cropland detection models to filter out non-cropland regions (cities, roads, forests, deserts), reducing dataset size and compute cost.
- Developing data/model compression strategies (mostly for GNNs and LLMs) to reduce compute/storage costs and support deployment in compute-constrained labs.

University of California, Riverside

August 2024 - October 2024

Visiting Junior Specialist, Supervised by Evangelos (Vagelis) Papalexakis

- Conducted research on tensor decomposition methods for precision agriculture.

Dalhousie University, Canada

January 2018 - July 2018

Visiting Student, Supervised by Evangelos E. Milios

- Built visual analytics and ML pipelines to model and characterize rumor propagation on Twitter and Reddit.

Education

University of São Paulo

August 2020 - January 2025

Ph.D. in Computer Science and Computational Mathematics

- **Thesis title:** Graph size reduction for representation learning.
- **Advisor:** Dr. Alneu de Andrade Lopes.
- **With a visiting period at:** University of California, Riverside. USA.
- **Advisor abroad:** Dr. Evangelos E. Papalexakis.

University of São Paulo

August 2016 - March 2020

M.Sc. in Computer Science and Computational Mathematics

- **Thesis title:** Analysis and classification of rumors in social networks.
- **Advisor:** Dr. Rosane Minghim.
- **With a visiting period at:** Dalhousie University. Canada.
- **Advisor abroad:** Dr. Evangelos E. Milios.

Federal University of Mato Grosso do Sul

February 2012 - June 2016

Bachelor's degree in Computer Science

- **Thesis title:** The Split Delivery Vehicle Routing Problem.
- **Advisor:** Dr. Edna Ayako Hoshino.

Publications

- Nícolás Roque dos Santos, Dawon Ahn, Diego Minatel, Alneu de Andrade Lopes, and Evangelos E. Papalexakis, *Multi-view Graph Condensation via Tensor Decomposition*. Proceedings of the Nineteenth ACM International Conference on Web Search and Data Mining (WSDM), 2026.
- Satish Chandran*, Nícolás Roque dos Santos*¹, Yunshu Wu, Greg Ver Steeg, and Evangelos E. Papalexakis, *Spectral Regularization for Diffusion Models*. Preprint, 2026.
- Diego Minatel, Antonio Rafael Sabino Parmezan, Nícolás Roque dos Santos, Mariana Cúri, Ricardo Bastos Cavalcante Prudêncio, and Alneu de Andrade Lopes, *FairDIF: Debiasing Classifiers with Item Response Theory and Differential Item Functioning*. AI and Ethics, 2026.

^{1*}Equal contribution

- René Vieira Santin, Diego Minatel, Nícolas Roque dos Santos, and Solange Oliveira Rezende. Graph Condensation for Text Classification. Brazilian Conference on Intelligent Systems (BRACIS), 2025
- Nícolas Roque dos Santos, Diego Minatel, Alan Demétrius Baria Valejo, *One-mode Projection of Bipartite Graphs for Text Classification using Graph Neural Networks*, Proceedings of the 40th ACM/SIGAPP Symposium on Applied Computing (SAC), 2025.
- Diego Minatel, Antonio Rafael Sabino Parmezan, Nícolas Roque dos Santos, Mariana Cúri, and Alneu de Andrade Lopes. DIF-PP: Threshold Optimization Informed by IRT Models for Group Fairness in Machine Learning. ACM SIGAPP Applied Computing Review, 2025.
- Diego Minatel, Antonio Rafael Sabino Parmezan, Nícolas Roque dos Santos, Mariana Cúri, and Alneu de Andrade Lopes. A DIF-Driven Threshold Tuning Method for Improving Group Fairness. Proceedings of the 40th ACM/SIGAPP Symposium on Applied Computing (SAC), 2025.
- Diego Minatel, Nícolas Roque dos Santos, Angelo Cesar Mendes da Silva, Mariana Cúri, Ricardo Marcondes Marcacini, and Alneu de Andrade Lopes. Influence of data stratification criteria on fairer classifications. Journal of Information and Data Management, 2025.
- Nícolas Roque dos Santos, Diego Minatel, Alan Demétrius Baria Valejo, and Alneu de Andrade Lopes. *Semi-Supervised Coarsening of Bipartite Graphs for Text Classification via Graph Neural Network*. IEEE 11th International Conference on Data Science and Advanced Analytics (DSAA), 2024.
- Nícolas Roque dos Santos, Diego Minatel, Alan Demétrius Baria Valejo, and Alneu de Andrade Lopes. *Bipartite Graph Coarsening for Text Classification using Graph Neural Networks*. 26th Iberoamerican Congress on Pattern Recognition (CIARP), 2023.
- Diego Minatel, Nícolas Roque dos Santos, Angelo Cesar Mendes da Silva, Mariana Cúri, Ricardo Marcondes Marcacini, and Alneu de Andrade Lopes. *Unfairness in Machine Learning for Web Systems Applications*. 29th Brazilian Symposium on Multimedia and the Web (WebMedia), 2023.
- Diego Minatel, Nícolas Roque dos Santos, Vinícius Ferreira da Silva, Mariana Cúri, and Alneu de Andrade Lopes. *Item Response Theory in Sample Reweighting to Build Fairer Classifiers*. 10th International Conference on Information Management and Big Data (SIMBig), 2023.
- Diego Minatel, Angelo Cesar Mendes da Silva, Nícolas Roque dos Santos, Mariana Cúri, Ricardo Marcondes Marcacini, and Alneu de Andrade Lopes. *Data stratification analysis on the propagation of discriminatory effects in binary classification*. XI Symposium on Knowledge Discovery, Mining, and Learning (KDMiLe), 2023.

Teaching Experience

Artificial Intelligence

2021, 2022, and 2023

University of São Paulo, Teaching Assistant

- Prepared assignments and programming projects.
- Held weekly office hours for a class of 50+ undergrad students.
- Graded exams and assignments.

Complex Networks

March 2023 - May 2023

University of São Paulo, Teaching Assistant

- Verified the content and suggested improvements to the course's recorded lectures, assignments, and exams.
- Held biweekly office hours for a class of 78 MBA students.

Neural Networks and Deep Learning

October 2022 - December 2022

University of São Paulo, Teaching Assistant

- Verified the content and suggested improvements to the course's recorded lectures, assignments, and exams.
- Held weekly office hours for a class of 127 MBA students.

Machine Learning and Data Mining applications

August 2022 - December 2022

University of São Paulo, Teaching Assistant

- Prepared and graded assignments.
- Held weekly office hours for a class of 10 undergrad students.

Introduction to Intelligent Systems

August 2021 - December 2021

University of São Paulo, Teaching Assistant

- Prepared and graded assignments.
- Held weekly office hours for a class of 10 undergrad students.

Computer Graphics

February 2017 - July 2017

University of São Paulo, Teaching Assistant

- Prepared course material including OpenGL lectures, exams and monthly assignments.
- Presented eight OpenGL lectures.
- Held weekly office hours for a class of 90 undergrad students.
- Graded exams and monthly assignments.

Software Engineering

February 2015 - July 2015

Federal University of Mato Grosso do Sul, Teaching Assistant

- Prepared weekly assignments and quizzes for the course.
- Held weekly office hours for a class of 60 undergrad students.
- Graded assignments.

Student Mentoring/Advising

Undergraduate - current

1. Aidan Monfort, CSE BS student at University of California, Riverside
2. Isabela Sforcin, CSE BS student at University of California, Riverside (co-mentored with Evangelos Papalexakis and Jia Chen)

Volunteers - current

1. Vinz Angelo Madrigal, BS in CSE from University of California, Riverside (co-mentored with Dawon Ahn)

Undergraduate - past

1. Alec Peter Blevins, 2025 NSF Data Science REU at UCR, CS BS student at Connecticut College (co-mentored with Evangelos Papalexakis and Jia Chen)
2. Yuvaraj Vagula, 2025 NSF Data Science REU at UCR, CS and DS BS student at Cleveland State University (co-mentored with Evangelos Papalexakis and Jia Chen)
3. Marina Wild, 2025 NSF Data Science REU at UCR, CS BS student at University of California, Riverside (co-mentored with Evangelos Papalexakis and Jia Chen)
4. Ryan Chung, 2025 NSF Data Science REU at UCR, CS BS student at University of Wisconsin–Madison (co-mentored with Evangelos Papalexakis and Jia Chen)
5. Oscar Ruiz, 2025 UCR's Digital Agricultural Fellowship (DAF) for Community College Students, CS BS student at Crafton Hills College

Academic Service

- **Program committees:** ECML PKDD 2024-2026
- **Conference paper reviewing:** ECML PKDD, The Web Conference (née WWW), and Brazilian Conference on Intelligent Systems (BRACIS)
- **Journal reviewing:** IEEE Transactions on Knowledge & Data Engineering (TKDE), and Elsevier Information Sciences

Invited Talks and Panels

1. **Invited talk.** Graph Neural Networks: From Basics to Graph Condensation, UCR's NSF Data Science Research Experiences for Undergraduates (REU), June 2025.
2. **Invited talk.** Towards Anomaly Detection in Crop Fields using Planet Labs Imagery. UCR's Planet Imagery Day, May 2025.
3. **Panel.** PhD Student Life, Student Forum at IEEE DSAA 2024, October 2024.

Academic Awards and Scholarships

- Coordination of Superior Level Staff Improvement (CAPES) scholarship. Fully funded scholarship to visit the University of California, Riverside, for six months to conduct research in Graph Neural Networks and Tensor Decomposition (2024).
- IEEE Computational Intelligence Society (IEEE CIS). Travel award to attend the IEEE International Conference on Data Science and Advanced Analytics (DSAA) in San Diego, California (2024).
- Coordination of Superior Level Staff Improvement (CAPES) scholarship. Fully funded scholarship to pursue a Ph.D. in Computer Science at the University of São Paulo, Brazil (2020).
- Emerging Leaders in the Americas Program (ELAP) scholarship. Fully funded scholarship to conduct research in Visual Analytics and Machine Learning for six months at Dalhousie University, Canada (2018).
- Coordination of Superior Level Staff Improvement (CAPES) scholarship. Fully funded scholarship to pursue a M.Sc. in Computer Science at University of São Paulo, Brazil (2016).
- Best Undergraduate Student Poster, Regional School of Informatics of the state of Mato Grosso do Sul (2015).
- Distinguished Program Committee Member for ECML-PKDD 2025.

References

Evangelos E. Papalexakis, Ph.D., Full Professor, Department of Computer Science, University of California, Riverside. Email: epapalex@cs.ucr.edu

Elia Scudiero, Ph.D., Associate Professor, Department of Environmental Sciences, University of California, Riverside. Email: elia.scudiero@ucr.edu

Alneu de Andrade Lopes, Ph.D., Associate Professor, Department of Computer Science, University of São Paulo. Email: alneu@icmc.usp.br