

# JHONY H. GIRALDO

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<https://jhonygiraldo.github.io/>

## ACADEMIC APPOINTMENTS

**Télécom Paris, Institut Polytechnique de Paris, France.**

**Oct 2022 - Present**

- Assistant Professor in Learning for Video Processing and Computer Vision. Oct 2022 - Present
- Member of the Information Processing and Communications Laboratory (LTCI), Multimedia Team.

## EDUCATION

**Doctor of Philosophy in Applied Mathematics**

Oct 2019 - Sep 2022

La Rochelle Université, Laboratoire MIA (Mathématiques, Image, et Applications), La Rochelle, France

Thesis: *Graph-based Algorithms in Computer Vision, Machine Learning, and Signal Processing*

**Master of Science in Engineering (with Honors)**

Aug 2016 - Jun 2018

Universidad de Antioquia, Medellín, Colombia

Thesis: *Recognition of Mammal Genera on Camera-trap Images using Convolutional Neural Networks*

**Bachelor of Science in Electronics Engineering**

Feb 2011 - Mar 2016

Universidad de Antioquia, Medellín, Colombia

Thesis: *Semi-supervised Recognition of the *Diploglossus Millepunctatus* Lizard Species using Computer Vision Algorithms*

## RESEARCH INTERESTS

Geometric Deep Learning (Simplicial and Graph Neural Networks), Machine Learning, Computer Vision, Graph Signal Processing.

## ACADEMIC EXPERIENCE

**Visiting Research Scholar**

Geometric Deep Learning, EPFL, LTS4 laboratory.

Oct 2024 - Nov 2024

Graph Representation Learning, CentraleSupélec, Inria, Université Paris-Saclay.

Jan 2022 - May 2022

Computer Vision, Università di Napoli Parthenope, CVPR Lab “Alfredo Petrosino”.

Aug 2021 - Nov 2021

Graph Signal Processing, University of Delaware.

Jun 2018 - Aug 2018

**Research Assistant**

Graph Representation Learning, La Rochelle Université, Laboratoire MIA.

Oct 2019 - Sep 2022

Graph Signal Processing, University of Delaware.

Sep 2018 - Aug 2019

Computer Vision and Pattern Recognition, Universidad de Antioquia.

Aug 2016 - Jun 2018

**Lecturer**

La Rochelle Université, France.

Sep 2020 - Jun 2021

Universidad de Antioquia, Colombia.

Aug 2017 - Jun 2018

**Teaching Assistant**

Universidad de Antioquia, Colombia.

Feb 2014 - Nov 2015

## PUBLICATIONS

### Journal Papers

- Jhony H. Giraldo**, Aref Einizade, Andjela Todorovic, Jhon A. Castro-Correa, Mohsen Badiy, Thierry Bouwmans, Fragkiskos D. Malliaros. “*Higher-Order GNNs Meet Efficiency: Sparse Sobolev Graph Neural Networks*”, IEEE Transactions on Signal and Information Processing over Networks, 2024.

- Jhon A. Castro-Correa, **Jhony H. Giraldo**, Mohsen Badiy, Fragkiskos D. Malliaros. “*Gegenbauer Graph Neural Networks for Time-varying Signal Reconstruction*”, IEEE Transactions on Neural Networks and Learning Systems, 2024.
- Aref Einizade, **Jhony H. Giraldo**, Fragkiskos D. Malliaros, Sepideh Hajipour Sardouie. “*Estimation of a Causal Directed Acyclic Graph Process using Non-Gaussianity*”, Digital Signal Processing, 2024.
- Nestor Rendon, **Jhony H. Giraldo**, Thierry Bouwmans, Susana Rodríguez-Buritica, Edison Ramirez, Claudia Isaza, “*Uncertainty Clustering Internal Validity Assessment using Fréchet Distance for Unsupervised Learning*”, Engineering Applications of Artificial Intelligence, 2023.
- **Jhony H. Giraldo**, Sajid Javed, Thierry Bouwmans, “*Graph Moving Object Segmentation*”, IEEE Transactions on Pattern Analysis and Machine Intelligence, 44(5), pp. 2485-2503, 2022.
- **Jhony H. Giraldo**, Arif Mahmood, Belmar Garcia-Garcia, Dorina Thanou, Thierry Bouwmans, “*Reconstruction of Time-varying Graph Signals via Sobolev Smoothness*”, IEEE Transactions on Signal and Information Processing over Networks, 8, pp. 201-214, 2022.
- Marwa Chendeb El Rai, **Jhony H. Giraldo**, Mina Al-Saad, Muna Darweech, Thierry Bouwmans, “*SemiSegSAR: A Semi-supervised Segmentation Algorithm for Ship SAR Images*”, IEEE Geoscience and Remote Sensing Letters, 19, pp. 1-5, 2022.
- Alejandro Parada-Mayorga, Daniel L. Lau, **Jhony H. Giraldo**, Gonzalo R. Arce, “*Blue-Noise Sampling on Graphs*”, IEEE Transactions on Signal and Information Processing over Networks 5(3), pp. 554-569 (2019).
- **Jhony H. Giraldo**, Augusto Salazar, Alexander Gomez, Angélica Diaz-Pulido, “*Camera-trap Images Segmentation using Multi-layer Robust Principal Component Analysis*”, The Visual Computer 35(3), pp. 335-347 (2019).
- **Jhony H. Giraldo**, Augusto Salazar, German Diez, Alexander Gomez, Tatiana Martinez, Jesús F. Vargas Bonilla, Mariana P. Vasquez, “*Automatic Identification of Scenedesmus Polymorphic Microalgae from Microscopic Images*”, Pattern Analysis and Applications 21(2), pp. 601-612 (2018).

## Conference Papers

- Dorian Gailhard, Enzo Tartaglione, Lirida Naviner, **Jhony H. Giraldo**, “*HYGENE: A Diffusion-based Hypergraph Generation Method*”, AAAI Conference on Artificial Intelligence (2025). (**Accepted**)
- Julian Santamaria, Claudia Isaza, **Jhony H. Giraldo**, “*CATALOG: A Camera Trap Language-guided Contrastive Learning Model*”, IEEE/CVF Winter Conference on Applications of Computer Vision (2025). (**Accepted**)
- Gabriele Spadaro, Marco Grangetto, Attilio Fiandrotti, Enzo Tartaglione, **Jhony H. Giraldo**, “*WiGNet: Windowed Vision Graph Neural Network*”, IEEE/CVF Winter Conference on Applications of Computer Vision (2025). (**Accepted**)
- Aref Einizade, Fragkiskos D. Malliaros, **Jhony H. Giraldo**, “*Continuous Product Graph Neural Networks*”, Advances in Neural Information Processing Systems (2024). (**Accepted**)
- Shifeng Xie, **Jhony H. Giraldo**, “*Variational Graph Contrastive Learning*”, Self-Supervised Learning - Theory and Practice, NeurIPS Workshop (2024). (**Accepted**)
- Hamza Rami, **Jhony H. Giraldo**, Nicolas Winckler, Stéphane Lathuilière, “*Privacy-Preserving Adaptive Re-Identification without Image Transfer*”, European Conference on Computer Vision (2024). (**Oral Presentation**)
- Muhammad Rameez Ur Rahman, **Jhony H. Giraldo**, Indro Spinelli, Stéphane Lathuilière, Fabio Galasso, “*OVOSE: Open-Vocabulary Semantic Segmentation in Event-Based Cameras*”, International Conference on Pattern Recognition (2024).
- Gabriele Spadaro, Alberto Presta, Enzo Tartaglione, **Jhony H. Giraldo**, Marco Grangetto, Attilio Fiandrotti, “*GABIC: Graph-based Attention Block for Image Compression*”, IEEE International Conference on

Image Processing (2024). (**Oral Presentation**)

- Zied Mnasri, **Jhony H. Giraldo**, Thierry Bouwmans, “*Anomalous Sound Detection for Road Surveillance based on Graph Signal Processing*”, European Conference on Signal Processing (2024).
- Hamza Rami, **Jhony H. Giraldo**, Nicolas Winckler, Stéphane Lathuilière, “*Source-Guided Similarity Preservation for Online Person Re-Identification*”, IEEE/CVF Winter Conference on Applications of Computer Vision (2024).
- **Jhony H. Giraldo**, Konstantinos Skianis, Thierry Bouwmans, Fragkiskos Malliaros “*On the Trade-off between Over-smoothing and Over-squashing in Deep Graph Neural Networks*”, ACM Conference on Information and Knowledge Management (2023). (**Oral Presentation**)
- Nicola Corbellini, **Jhony H. Giraldo**, Giovanna Varni, Gualtiero Volpe “*Few Labels are Enough! Semi-supervised Graph Learning for Social Interaction*”, IEEE/CVF International Conference on Computer Vision - Workshops (2023). (**Best Paper Award Artificial Social Intelligence Workshop**)
- Gabriele Spadaro, Riccardo Renzulli, Andrea Bragagnolo, **Jhony H. Giraldo**, Attilio Fiandrotti, Marco Grangetto, Enzo Tartaglione, “*Shannon Strikes Again! Entropy-based Pruning in Deep Neural Networks for Transfer Learning under Extreme Memory and Computation Budgets*”, IEEE/CVF International Conference on Computer Vision - Workshops (2023).
- Wieke Prummel, **Jhony H. Giraldo**, Anastasia Zakharova, Thierry Bouwmans “*Inductive Graph Neural Networks for Moving Object Segmentation*”, IEEE International Conference on Image Processing (2023).
- **Jhony H. Giraldo**, Sajid Javed, Arif Mahmood, Fragkiskos D. Malliaros, Thierry Bouwmans, “*Higher-order Sparse Convolutions in Graph Neural Networks*”, IEEE International Conference on Acoustics, Speech, and Signal Processing (2023).
- Jhon A. Castro-Correa, **Jhony H. Giraldo**, Anindya Mondal, Mohsen Badiy, Thierry Bouwmans, Fragkiskos D. Malliaros, “*Time-varying Signals Recovery via Graph Neural Networks*”, IEEE International Conference on Acoustics, Speech, and Signal Processing (2023).
- **Jhony H. Giraldo**, Vincenzo Scarrica, Antonino Staiano, Francesco Camastra, Thierry Bouwmans, “*Hypergraph Convolutional Networks for Weakly-Supervised Semantic Segmentation*”, IEEE International Conference on Image Processing (2022). (**Oral Presentation**)
- **Jhony H. Giraldo**, Sajid Javed, Naoufel Werghi, Thierry Bouwmans. “*Graph CNN for Moving Object Detection in Complex Environments from Unseen Videos*”, IEEE/CVF International Conference on Computer Vision - Workshops (2021).
- Anindya Mondal, Shashant R., **Jhony H. Giraldo**, Thierry Bouwmans, Ananda S Chowdhury. “*Moving Object Detection for Event-based Vision using Graph Spectral Clustering*”, IEEE/CVF International Conference on Computer Vision - Workshops (2021).
- **Jhony H. Giraldo**, Thierry Bouwmans. “*GraphBGS: Background Subtraction via Recovery of Graph Signals*”, International Conference on Pattern Recognition (2021).
- **Jhony H. Giraldo**, Sajid Javed, Maryam Sultana, Soon Ki Jung, Thierry Bouwmans. “*The Emerging Field of Graph Signal Processing for Moving Object Segmentation*”, International Workshop on Frontiers of Computer Vision (2021).
- Maryam Sultana, Thierry Bouwmans, **Jhony H. Giraldo**, Soon Ki Jung. “*Robust Foreground Segmentation in RGBD Data from Complex Scenes using Adversarial Networks*”, International Workshop on Frontiers of Computer Vision (2021).
- **Jhony H. Giraldo**, Thierry Bouwmans, “*Semi-supervised Background Subtraction of Unseen Videos: Minimization of the Total Variation of Graph Signals*”, IEEE International Conference on Image Processing (2020).
- **Jhony H. Giraldo**, Thierry Bouwmans, “*On the Minimization of Sobolev Norms of Time-Varying Graph Signals: Estimation of New Coronavirus Disease 2019 Cases*”, IEEE International Workshop on Machine

Learning for Signal Processing (2020).

- Alejandro Parada-Mayorga, Daniel L. Lau, **Jhony H. Giraldo**, Gonzalo R. Arce, “*Blue-Noise Sampling of Signals on Graphs*”, International Conference on Sampling Theory and Applications (2019).
- Alejandro Parada-Mayorga, Daniel L. Lau, **Jhony H. Giraldo**, Gonzalo R. Arce, “*Sampling of Graph Signals with Blue Noise Dithering*”, IEEE Data Science Workshop (2019).
- **Jhony H. Giraldo**, Augusto Salazar, Alexander Gomez, Angélica Diaz-Pulido, “*Recognition of Mammal Genera on Camera-trap Images using Multi-layer Robust Principal Component Analysis and Mixture Neural Networks*”, IEEE International Conference on Tools with Artificial Intelligence (2017).
- Alexander Gomez, German Diez, **Jhony H. Giraldo**, Augusto Salazar, Juan M. Daza, “*A Markov Random Field and Active Contour Image Segmentation Model for Animal Spots Patterns*”, International Symposium on Visual Computing (2015).

## PATENTS

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- Hamza Rami, Nicolas Winckler, **Jhony H. Giraldo**, Stéphane Lathuilière, “Method, Device, and Computer Program for Adapting an ANN Model for Person Re-identification on a Target Domain”, U.S. Patent Application No. 18/587,155 (2024).
- Hamza Rami, Nicolas Winckler, **Jhony H. Giraldo**, Stéphane Lathuilière, “Method for Performing Privacy-preserving Federated Learning in the Framework of Re-identification”, European Patent.

## TEACHING

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- Machine Learning with Graphs. January 2025 - Present
- Machine Learning with Graphs, Artificial Intelligence Summer School, CentraleSupélec. July 2024  
**Content:** Introduction to Graph Neural Networks.
- Deep Learning for Computer Vision, Télécom Paris. Nov 2023 - Present  
**Content:** Point Clouds and Graph Neural Networks.
- Signal Representation, Télécom Paris. Oct 2023 - Present  
**Content:** Wavelets.
- Advanced Machine Learning, Télécom Paris. Mar 2023 - Present  
**Content:** Graph Neural Networks.
- Lab Introduction to Deep Learning, Télécom Paris. Mar 2023 - Present  
**Content:** Convolutional Neural Networks.
- Lab Machine Learning, Télécom Paris. Mar 2023  
**Content:** Decision Trees, Neural Networks, Support Vector Machines.
- Lab Introduction to Computer Vision, Télécom Paris. Dec 2022  
**Content:** Sampling Theory, Filtering, Restoration, Mathematical Morphology, Segmentation, Feature Detection, Motion Estimation.

## SUPERVISING ACTIVITIES

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### Postdoctoral Researchers

- Aref Einizade, Postdoctoral Researcher, Geometric Deep Learning. Nov 2023 - Present.

### Ph.D. Students

- Sarra Khaïri, Ph.D. Student at Télécom Paris, Computer Vision. Jun 2024 - Present.
- Dorian Gailhard, Ph.D. Student at Télécom Paris, Hypergraph Generation. May 2024 - Present.
- Vahan Martirosyan, Ph.D. Student at CentraleSupélec, Graph Neural Networks. Nov 2023 - Present.

- Gabriele Spadaro, Ph.D. Student at University of Turin, Computer Vision. Feb 2023 - Present.

### Master Students

- Julian Santamaria, Master Student at Universidad de Antioquia, Computer Vision. Feb 2024 - Present.

### Alumni:

- Hamza Rami, Ph.D. Student at Télécom Paris, Computer Vision. Oct 2022 - May 2024.
- Vahan Martirosyan, Master Student at Université Paris-Saclay, Graph Neural Networks. May - Sep 2023.
- Nicolas Dunou, Master Student at Université PSL, Graph Neural Networks. Jun - Sep 2023.
- Nacereddine Laddaoui, Master Student at Sorbonne Université, Computer Vision. Apr - Sep 2023.

## GRANTS AND FUNDING SOURCES

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- Agence Nationale de la Recherche (ANR) Project DeSNAP “*Deep Simplicial Neural Networks for Advanced Geometry Processing*”. **Role:** PI. € 337,862. 2025 - 2029.
- NVIDIA Academic Grant Program Award “*Bridging the Gap between Foundation Models and Camera Trap Image Recognition*”. **Role:** PI. 10,000 A100 GPU-Hours. Jan 2025 - Jun 2025.
- Agence Nationale de la Recherche (ANR) Project SODA “*System On Chip Design leveraging Artificial Intelligence*”. **Role:** Team Member. € 531,000. 2023 - 2027.
- Hi! Paris Postdoc Fellowship (Aref Einizade) “*Learning Multi-domain Graphs from Data via Graph Machine Learning: Theoretical Analysis and Applications*”. **Role:** Advisor. € 120,000. 2023 - 2025.

### Small Grants:

- Grant “*EuroTech Visiting Professor Programme*”, EuroTech, 2024. € 3,000.
- Grant “*Mobilité Internationale*”, Institut DATAIA, Université Paris-Saclay, 2022. € 5,000.
- Grant “*Mobilité Internationale des Doctorants*”, La Rochelle Université, 2021. € 3,600.
- Stipend for “*Summer Research Program at University of Delaware*”, 2018. \$ 3,000.

## AWARDS AND HONORS

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- **Best paper award** for “*Few Labels are Enough! Semi-supervised Graph Learning for Social Interaction*” published on IEEE/CVF ICCV-W (Artificial Social Intelligence Workshop) 2023.
- Outstanding distinction master thesis (equivalent to **Magna Cum Laude**), “*Recognition of Mammal Genera on Camera-trap Images using Convolutional Neural Networks*”, Universidad de Antioquia, 2018.
- Best students SABER PRO Colombia (general examination for senior undergraduate students), 2015.

## ORGANIZING COMMITTEE

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- Co-organizer, Learning on Graphs Conference, Local Meetup, Paris, France, 2024.
- Program Chair, International Workshop “LatinX in CV” (LXCV) Research at IEEE/CVF International Conference on Computer Vision (ICCV), Paris, France, 2023.
- Track Chair, Special Session “GraDSi: Graph Data Science and Applications” at IEEE International Conference on Data Science and Advance Analytics (DSAA), Thessaloniki, Greece, 2023.
- Senior Organization Member, 8th Junior Conference on Data Science and Engineering (JDSE), Paris, France, 2023.
- Volunteer Chair, International Workshop “LatinX in CV” (LXCV) Research at IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), Vancouver, Canada, 2023.

**Area Chair Conferences:** British Machine Vision Conference (BMVC), Glasgow, UK, 2024.

**Journal Reviewer:** Journal of Machine Learning Research, IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Image Processing, IEEE Transactions on Signal Processing, IEEE Transactions on Multimedia, IEEE Transactions on Signal and Information Processing over Networks, Neural Networks, Computer Vision and Image Understanding, IEEE Sensors Journal, Information Sciences, Neurocomputing, and Methods in Ecology & Evolution.

**Program Committee - Conferences:** CVPR (2022, 2023, 2024, 2025), ICCV 2023, AISTATS 2023, ECCV (2022, 2024), WACV 2025.

**Program Committee - Workshops:** ICCV-W on Assistive Computer Vision and Robotics (ACVR 2023), CVPR-W LatinX in Computer Vision (2021, 2022), ECCV-W LatinX in Computer Vision 2022, ICCV-W on When Graph Signal Processing meets Computer Vision 2021, ICCV-W on Robust Subspace Learning and Applications in Computer Vision 2019.

## PARTICIPATION IN PHD COMMITTEES

- Wieke Prummel, Ph.D. in Applied Mathematics, La Rochelle Université. November 2024.

## INVITED TALKS

- *“Hypergraph Generation and Continuous Product GNNs”*, Presented between November-December 2024 at: 1) EPFL, LTS4 Lab, Lausanne, Switzerland; and 2) ICPR Workshop, Graph Learning and Graph Signal Processing Algorithms in Computer Vision (G2SP-CV), Virtual.
- *“Seminar: A Journey Through Graphs for Spatiotemporal Analysis”*, Presented on October 2024 at the DEGAS Webinar Series 2024, virtually.
- *“Keynote: A Journey Through Graphs for Spatiotemporal Analysis”*, Presented on September 2024 at the MATHIAS Days International Conference by TotalEnergies R&D 2024, in Magny-le-Hongre, France
- *“Keynote: A Journey Through Graphs for Reconstructing Time Series”*, Presented on July 2024 at the IDS day of Télécom Paris, Paris, France.
- *“Seminar: Graph-based Algorithms in Computer Vision, Machine Learning, and Signal Processing”*, Presented between March-May 2022 at: 1) ESIEE, Équipe A3SI, Paris, France; 2) CentraleSupélec, Centre de Vision Numérique, Inria OPIS, Paris, France; and 3) Télécom Paris, Multimedia Team, Paris, France.
- *“Seminar: Graph-based Algorithms in Computer Vision and Machine Learning: Theory and Applications”*, Presented on November 2021, at Università di Napoli Parthenope, Naples, Italy.
- *“Graph Moving Object Segmentation”*, Presented on October 2021, at DAGM German Conference on Pattern Recognition (Pattern Recognition and Computer Vision Nectar Track), Virtual.
- *“The Emerging Field of Graph Signal Processing: Overview and Applications to Computer Vision and Machine Learning”*, Presented on September 2020, at Innovation, Technology and Engineering Congress (ITEC 2020 - Virtual), La Paz, Bolivia.

## COMPUTER SKILLS

### Programming Languages

Python, Matlab, C/C++.

### Relevant Libraries

PyTorch, PyG (PyTorch Geometric), OpenCV, L<sup>A</sup>T<sub>E</sub>X, Qt, Arduino.

## LANGUAGES

Spanish: Native Language.

English: C1. TOEFL: 93/120 (2018), C1. IELTS: 7.5/9 (2022), Full Professional Proficiency.

French: B2. Professional Working Proficiency.