Roman Alejandro Jacome Carrascal

Ph.D Student

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e-mail: rajaccar@correo.uis.edu.co

Research Topics

Computational Imaging, Learning-Based Algorithms for Inverse Problems, Signal Processing, Convex Optimization

Education

Ph.D Student. Advisor Professor Henry Arguello, January 2024 - Present

Master's in Applied Mathematics at Universidad Industrial de Santander. Advisor Professor Henry Arguello *GPA: 4.54.* February 2022 – March 2024

Electronics Engineering Bachelor September 2016 – September 2021
Mentors: Jorge Bacca and Henry Arguello. *GPA: 4.07*

Acknowledgments & Awards

Laureate Master Thesis: *Optimization of a Computational Imaging System by Statistical Regularization Based on a Deep Learning Method*
IEEE ICASSP 2025 Student Travel Grant

Teaching Experience

1. Undergraduate Numerical Methods Course (2024-II and 2025-I) at Universidad Industrial de Santander, Colombia

2. Graduate Digital Signal Processing Course (2024-II) at Universidad Industrial de Santander, Colombia

Journal Papers

1. **D^{2}UF: Deep Coded Aperture Design and Unrolling Algorithm for Compressive Spectral Image Fusion**
Roman Jacome, Jorge Bacca, Henry Arguello
★ *IEEE Journal of Selected Topics in Signal Processing* https://ieeexplore.ieee.org/abstract/document/9894667

2. **Dual-blind deconvolution for overlaid radar-communications systems**
Edwin Vargas, Kumar Vijay Mishra, **Roman Jacome**, Brian M Sadler, Henry Arguello
IEEE Journal of Selected Areas in Information Theory https://ieeexplore.ieee.org/abstract/document/10159370

3. **Middle output regularized end-to-end optimization for computational imaging**
Roman Jacome, Pablo Gomez, Henry Arguello
★ *Optica* https://doi.org/10.1364/OPTICA.494924

4. **Multi-antenna dual-blind deconvolution for joint radar-communications via soman minimization**
Roman Jacome, Edwin Vargas, Kumar Vijay Mishra, Brian M. Sadler, Henry Arguello
Signal Processing
https://www.sciencedirect.com/science/article/pii/S0165168424001038

5. **DoDo: Double DOE Optical System for Multishot Spectral Imaging**
Sergio Urrea, **Roman Jacome**, M Salman Asif, Henry Arguello, Hans Garcia
★ *IEEE Journal of Selected Topics in Signal Processing*
https://ieeexplore.ieee.org/abstract/document/10533433

6. **An Invitation to Hypercomplex Phase Retrieval: Theory and Applications**
Roman Jacome, Kumar Vijay Mishra, Brian M Sadler, Henry Arguello
★ *IEEE Signal Processing Magazine*
https://ieeexplore.ieee.org/abstract/document/10640341

7. **Octonion Phase Retrieval**
Roman Jacome, Kumar Vijay Mishra, Brian M Sadler, Henry Arguello
IEEE Signal Processing Letters
https://ieeexplore.ieee.org/abstract/document/10552342/

8. **Distilling Knowledge for Designing Computational Imaging Systems**
Leon Suarez-Rodriguez, **Roman Jacome**, Henry Arguello
★ *IEEE Transactions on Computational Imaging*
https://ieeexplore.ieee.org/document/11174946/

9. **Optically Authenticated Hyperspectral Imaging: Detection and Restoration of Manipulated Data**
Pablo Gomez, **Roman Jacome**, Hans Garcia, Iñaki Esnaola, Henry Arguello
★ *IEEE Transactions on Geoscience and Remote Sensing*
https://ieeexplore.ieee.org/abstract/document/11538248/

Conferences

1. **GSNR: Graph Smooth Null-Space Representation for Inverse Problems**
Romario Gualdron, **Román Jacome**, Rafael S. Suarez, Henry Arguello
★ *CVPR 2026* https://arxiv.org/abs/2602.20328

2. **Performance Bounds On Parameter Estimation for Relative Phases In Multi-Agent Wireless Systems**
Sergio Urrea, **Roman Jacome**, Edwin Vargas, Kumar Vijay Mishra, Henry Arguello
ICASSP 2026 https://ieeexplore.ieee.org/abstract/document/11463326/

3. **NPN: Non-Linear Projections of the Null-Space for Imaging Inverse Problems**

Román Jacome, Romario Gualdron, Leon Suarez,Henry Arguello

★ *NeurIPS 2025* https://openreview.net/forum?id=G67ZNmeWJ5

4. **DICE: Diffusion Consensus Equilibrium for Sparse-view CT Reconstruction**

Leon Suarez-Rodriguez, **Roman Jacome,** Romario Gualdron-Hurtado, Ana Mantilla-Dulcey, Henry Arguello

CAMSAP 2025 https://arxiv.org/abs/2509.14566

5. **UTOPY: Unrolling Algorithm Learning via Fidelity Homotopy for Inverse Problems**

Roman Jacome, Romario Gualdrón-Hurtado, Leon Suarez-Rodriguez, Henry Arguello

CAMSAP 2025 https://arxiv.org/abs/2509.14394

6. **Deep Distillation Gradient Preconditioning for Inverse Problems**

Romario Gualdrón-Hurtado, **Roman Jacome**, Leon Suarez, Laura Galvis, Henry Arguello

CAMSAP 2025 https://arxiv.org/abs/2508.04832

STSIVA 2025 https://ieeexplore.ieee.org/abstract/document/11156574/

7. **Compressive sensing with augmented measurements via generative self-distillation**

Emmanuel Martinez, **Roman Jacome**, Romario Gualdrón-Hurtado, Iñaki Esnaola, Henry Arguello

SSP 2025 https://ieeexplore.ieee.org/abstract/document/11073277/

8. **Improving Compressive Imaging Recovery via Measurement Augmentation**

Romario Gualdron,**Román Jacome**, Leon Suarez, Emmanuel Martinez, Henry Arguello

ICASSP 2025 https://ieeexplore.ieee.org/abstract/document/10888734/

9. **Learning to reconstruct signals with Inexact sensing operator via knowledge distillation**

Román Jacome, Romario Gualdron, Leon Suarez,Luis Gonzalez, Henry Arguello

ICASSP 2025 https://ieeexplore.ieee.org/abstract/document/10887652/

10. **Compressive imaging reconstruction via conditional diffusion model with augmented measurements**

Emmanuel Martinez, Leon Suarez, Romario Gualdron , **Román Jacome**, Henry Arguello

ICASSP 2025 https://ieeexplore.ieee.org/abstract/document/10889114/

11. **Optical authenticity in Pushbroom system for spectral information protection**
Pablo Gomez, **Roman Jacome**, Emmanuel Martinez, Hans Garcia, Henry Arguello
ICASSP 2025 https://ieeexplore.ieee.org/abstract/document/10887702/

12. **Highly Constrained Coded Aperture Imaging Systems Design Via a Knowledge Distillation Approach**
Leon Suarez-Rodriguez, **Roman Jacome**, Henry Arguello
ICIP 2024 https://ieeexplore.ieee.org/abstract/document/10648100

13. **Multi-Antenna ISAC Receiver with n-Tuple Blind Deconvolution**
Roman Jacome, Edwin Vargas, Kumar Vijay Mishra, Brian M Sadler, Henry Arguello
IEEE ICASSP 2024 https://ieeexplore.ieee.org/abstract/document/10445951

14. **Learning Point Spread Function Invertibility Assessment for Image Deconvolution**
Romario Gualdrón-Hurtado, **Roman Jacome**, Sergio Urrea, Henry Arguello, Luis Gonzalez
EUSIPCO 2024 https://ieeexplore.ieee.org/document/10715342

15. **RGB-Guided Spectral Image Generation through GANs with Implicit Spectral Learning**
Emmanuel Martinez, **Roman Jacome**, Andrés Jerez, Henry Arguello
EUSIPCO 2024 https://ieeexplore.ieee.org/abstract/document/10715359

16. **Factor Graph Processing for Dual-Blind Deconvolution at ISAC Receiver**
Roman Jacome, Edwin Vargas, Kumar Vijay Mishra, Brian M Sadler, Henry Arguello
IEEE CAMSAP 2023 https://ieeexplore.ieee.org/abstract/document/10403486

17. **Optical Solutions for Spectral Imaging Inverse Problems with a Shift-Variant System.**
Sergio Urrea, **Roman Jacome**, M. Salman Asif, Henry Arguello, Hans Garcia
IEEE/CVF ICCV LatinX Workshop 2023
https://ieeexplore.ieee.org/abstract/document/10350664

18. **LD-GAN: Low-Dimensional Generative Adversarial Network for Spectral Image Generation with Variance Regularization**
Emmanuel Martinez, **Roman Jacome**, Alejandra Hernandez-Rojas and Henry Arguello
IEEE/CVF CVPR LatinX Workshop 2023

https://ieeexplore.ieee.org/abstract/document/10208921

19. **Stochastic Deep Image Prior for Multishot Compressive Spectral Image Fusion**
Roman Jacome, Brayan Monroy, Jorge Bacca and Henry Arguello
IEEE ICASSP 2023 https://ieeexplore.ieee.org/abstract/document/10193340

20. **Multi-dimensional dual-blind deconvolution approach toward joint radar-communications**
Roman Jacome, Kumar Vijay Mishra, Edwin Vargas, Brian M Sadler, Henry Arguello
2022 IEEE SPAWC https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9834016

21. **Joint Radar-Communications Processing from a Dual-Blind Deconvolution Perspective**
Edwin Vargas, Kumar Vijay Mishra, **Roman Jacome**, Brian M Sadler, Henry Arguello
IEEE ICASSP 2022 https://ieeexplore.ieee.org/document/9746868

22. **Deep-fusion: An end-to-end approach for compressive spectral image fusion**
Roman Jacome, Jorge Bacca, Henry Arguello
IEEE ICIP 2021 https://ieeexplore.ieee.org/document/9746868

Reviewing Service

- Journal in Selected Topics in Signal Processing
- Optics Express
- Transactions on Communications
- Transactions on Machine Learning Research
- 2025 Conference on Computer Vision and Pattern Recognition
- International Conference on Computer Vision
- 2025 - 2026 Conference on Computer Vision and Pattern Recognition, (Outstanding Reviewer in 2026, top 5% reviewer) https://media.eventhosts.cc/Conferences/CVPR2026/CVPR_main_conf_2026_-15.pdf)
- 2026 The British Machine Vision Conference (BMVC)
- 2026 Neural Information Processing Systems