Nelson E. Díaz-Díaz

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Bio: Received the B. Sc. and M. Sc. degrees in Computer Science from the Universidad Industrial de Santander, Colombia, in 2012 and 2015, respectively, and Ph. D. degrees in Electronic Engineering from the Universidad Industrial de Santander, Bucaramanga, Colombia in 2020, sponsored by a 727 Colciencias scholarship. Currently, he holds a Postdoctoral position with the Pontificia Universidad Católica de Valparaíso (PUCV), Santiago, Chile, under the supervision of Prof. Esteban Vera. His research interests include high-dimensional signal processing, sparse image representation, adaptive sensing, compressive video, and spectral image classification. **WebPage:** https://nelson10.github.io/

SKILLS

- Languages: Spanish (Native), English (B2), French (B2)
- Programming: Python (NumPy, SciPy, Matplotlib), MATLAB
- Document Creation: Office tools, LATEX

PROFESSIONAL EDUCATION

Doctor of Philosophy in Engineering: emphasis in electronic *2016-2020*
Department of Electrical and Computer Engineering
Universidad Industrial de Santander, Bucaramanga, Santander, Colombia
GPA: 4.55/5.00
Advisor: PhD. Henry Arguello
Doctoral thesis: “Coded Aperture Design for Adaptive Compressive Spectral Imaging"

Master of Science in Computer Science *2013-2015*
Department of Computer Science
Universidad Industrial de Santander, Bucaramanga, Colombia.
GPA: 4.72/5.00
Advisor: Ph.D. Henry Arguello.
Master thesis: “High-dynamic range compressive spectral imaging by adaptive filtering"

Bachelor of Science in Computer Science *2006-2012*
Department of Computer Science
Universidad Industrial de Santander, Bucaramanga, Colombia.
GPA: 3.88/5.00
Advisor: Ph.D. Lola Xiomara.
Graduate project:: "Immune algorithm to solve job shop scheduling".

PROFESSIONAL EXPERIENCE

Postdoctoral Research Associate - School of Electrical Engineering *August 2020 - Present*
Pontificia Universidad Católica de Valparaiso, Chile
Valparaiso, Chile

Assistant Professor Data Structures, Fundamentals of programming, Technology of the Information and Communication TIC *February 2020 - July 2020*
Department of Computer Science
Universidad de Investigación y Desarrollo, Bucaramanga, Colombia

Research Intern on Convolutional Sparse Coding for Motion Estimation of Ultrasound Imaging *Fall-winter 2018-2019*
TéSA, Telecommunications for Space an Aeronautics
Toulouse, France

Assistant Professor Digital image processing *2016-2017*
Department of Electrical Engineering
Universidad Industrial de Santander, Bucaramanga, Colombia

Research Intern on Adaptive Grayscale Coded Aperture Design *Summer 2015*
Department of Electrical and Computer Engineering
University of Texas A&M, College Station, TX, USA

Adjunct Researcher on Computational Optical Image Processing *2013-Present*
High-dimensional signal processing research group (HDSP)
Department of Computer Science
Universidad Industrial de Santander, Bucaramanga, Colombia

Research Assistant on Operation Research *2011-2012*
Research Group in Biomedical Engineering
Department of Computer Science
Universidad Industrial de Santander, Bucaramanga, Colombia

HONORS AND AWARDS

Meritorious doctoral thesis *March 10th, 2020*
Meritorious degree work
Universidad Industrial de Santander
Bucaramanga, Colombia

Colciencias Scholarship *2016 - 2019*
Scholarship to pursue Ph.D. studies in Colombia.
Francisco Jose de Caldas Institute for the Development of Science and Technology
Colciencias, Bogota D.C., Colombia

STUDENT CO-SUPERVISION

Diego Armando Pinzon *2012 - 2013*
Bachelor of Science in Computer Science
Universidad Industrial de Santander, Bucaramanga, Colombia

JOURNAL REVIEWER

Optics Express *2019 - Present*
Optica (Formerly Optical Society of America), USA

Applied Optics *2019 - Present*
Optica (Formerly Optical Society of America), USA

Journal of Electronic Imaging (JEI) *2021 - Present*
The International Society for Optics and Photonics, SPIE

ACADEMIC COLLABORATIONS

Universidad Industrial de Santander, Colombia *2013 - Present*
Collaboration with Dr. Henry Arguello
Project: Adaptive grayscale coded aperture design
Other activities: Joint development of grants and application to the Colombian Institute of Development of Science and Technology - Colciencias

JOURNAL PAPERS

1. Esteban Vera, Felipe Guzmán, and Nelson Díaz. Shuffled rolling shutter for snapshot temporal imaging. *Opt. Express*, 30(2):887–901, Jan 2022

2. Nelson Diaz, Omar Gallo, Jhon Caceres, and Hernan Porras. Real-time ground filtering algorithm of cloud points acquired using terrestrial laser scanner (tls). *International Journal of Applied Earth Observation and Geoinformation*, 105:102629, 2021

3. N. Diaz, J. M. Ramirez, E. Vera, and H. Arguello. Adaptive classification via spatial contextual information in multisensor compressive spectral imaging. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 14:9254–9266, 2021

4. Nelson Diaz, Carlos Hinojosa, and Henry Arguello. Adaptive grayscale compressive spectral imaging using optimal blue noise coding patterns. *Optics & Laser Technology*, 117:147–157, September 2019

5. Nelson Diaz, Hoover Rueda, and Henry Arguello. Adaptive filter design via a gradient thresholding algorithm for compressive spectral imaging. *Applied Optics*, 57(17):4890–4900, June 2018

6. Edson Flórez, Nelson Díaz, Wilfredo Gómez, Lola Bautista, and Darío Delgado. Evaluación de algoritmos bioinspirados para la solución del problema de planificación de trabajos. *I+ D Revista de Investigaciones*, 11(1):133–143, 2018

7. Nelson Diaz, Hoover Rueda Chacon, and Henry Arguello Fuentes. High-dynamic range compressive spectral imaging by grayscale coded aperture adaptive filtering. *Ingeniería e Investigación*, 35(3):53–60, 2015

CONFERENCE PAPERS

1. Felipe Guzmán, Nelson Díaz, and Esteban Vera. Improved compressive temporal imaging using a shuffled rolling shutter. In *OSA Optical Sensors and Sensing Congress 2021 (AIS, FTS, HISE, SENSORS, ES)*, page JTh6A.9. Optical Society of America, 2021

2. J. Bacca, N. Diaz, and H. Arguello. Compressive classification via deep learning using single-pixel measurements. In *2020 Data Compression Conference (DCC)*, pages 359–359, 2020

3. N. Diaz, C. Noriega-Wandurraga, A. Basarab, J.Y Tourneret, and H Arguello. Adaptive coded aperture design by motion estimation using convolutional sparse coding in compressive spectral video sensing. In *2019 IEEE 8th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), Guadeloupe, France*, pages 1–5, Dec 2019

4. N. Diaz, A. Basarab, J.Y. Tourneret, and H. Arguello. Cardiac motion estimation using convolutional sparse coding. In *2019 27th European Signal Processing Conference (EUSIPCO), Coruña, España*, Sep 2019

5. M. Marquez, N. Diaz, J. Bacca, S. Pertuz, and H. Arguello. Compressive light field spectral imaging in a single-sensor device by using coded apertures. In *Imaging and Applied Optics 2017 (3D, AIO, COSI, IS, MATH, pcAOP)*, page CTh1B.5. Optical Society of America, 2017

6. N. Diaz, J. Bacca, and H. Arguello. Gradient thresholding algorithm for adaptive colored coded aperture design in compressive spectral imaging. In *Imaging and Applied Optics 2017 (3D, AIO, COSI, IS, MATH, pcAOP), San Francisco, California*, page JTu5A.4. Optical Society of America, 2017

7. Nelson Diaz, Hoover Rueda, and Henry Arguello. Adaptive uniform grayscale coded aperture design for high dynamic range compressive spectral imaging. In *Hyperspectral Imaging Sensors: Innovative Applications and Sensor Standards, Baltimore, USA*, volume 9860, page 98600A. International Society for Optics and Photonics, 2016

8. N. Diaz, H. Rueda, and H. Arguello. High-dynamic range compressive spectral imaging by adaptive filtering. In *2015 3rd International Workshop on Compressed Sensing Theory and its Applications to Radar, Sonar and Remote Sensing (CoSeRa)*, pages 89–93, June 2015

MEMBERSHIPS

- IEEE Signal Processing Society, Member
- Optica (Formerly Optical Society of America), Member