

Leidy Dorado-Munoz

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Researcher with strong math background and 10+ years of hands-on experience in the development and implementation of novel algorithms for data exploitation and machine learning models for the processing of high dimensional image data. Eager learner with listening and problem solving skills, fast learner, team player, self-motivated and self-regulating independent researcher. Coding experience in programming languages.

Experience

- 2016–2017 **Postdoctoral Researcher**, *Chester F. Carlson Center for Imaging Science*, Rochester Institute of Technology.
- Designed a Pan-sharpening based methodology for integrating spatial and spectral information of imagery of the ancient Gough map of Great Britain. Faded spatial details were visually enhanced without impact the spectral fidelity.
 - Used linear and non-linear manifold learning methods in the spectral analysis of Gough map's spatial details such as outlines of buildings, roofs and strokes of letters/words.
- 2012–2016 **Graduate Research Assistant**, *Digital Imaging and Remote Sensing Lab*, Rochester Institute of Technology.
- Created a completely framework for detecting particular materials in hyperspectral images using a graph-based embedding model (Schroedinger Eigenmaps). This is one of the few detection methodologies based on graph-models that has detection rates of 0.9 in average and false alarm rates in the order of thousandths.
 - Built a target detection framework that used graph-based pixel-clustering as background models in different statistical and geometric target detectors.
- 2010–2011 **Research Associate**, *Laboratory for Applied Remote Sensing and Image Processing*, University of Puerto Rico - Mayaguez.
- Proposed a methodology for ship detection in multispectral images with low spatial resolution, by the identification of plumes emitted in clouds.
 - Advanced a testing image database for the Lab by collecting free-online multispectral images of ships transiting by the Caribbean sea.
 - Contributed in the acquisition of hyperspectral imagery for the detection of hazardous compounds by using a SOC 700 hyperspectral camera.
- 2007–2009 **Graduate Research Assistant**, *Laboratory for Applied Remote Sensing and Image Processing*, University of Puerto Rico - Mayaguez .
- Devised an interest point detector for multispectral and hyperspectral imagery based on the SIFT keypoint detector, where each pixel is processed as a vector. This was the first SIFT-based interest point detector extension to spectral imagery that does not used a band by band approach for processing the image.

Education

- 2011–2016 **PhD, Imaging Science**.
Rochester Institute of Technology
Thesis: Spectral Target Detection using Schroedinger Eigenmaps
- 2007–2009 **MS, Electrical Engineering**.
University of Puerto Rico - Mayaguez
Thesis: A Vector Sift Operator for Interest Point Detection in Vector Imagery and its Application to Multispectral and Hyperspectral Imagery
- 2000–2006 **BS, Engineering Physics**.
University of Cauca in Popayan (Cauca) - Colombia

certifications: Applied Data Science with Python, a 5-course specialization by University of Michigan on Coursera. Specialization Certificate earned on October 13, 2018

Technical Skills

languages Matlab,IDL,Python,R programming
technologies ENVI, L^AT_EX, Jupiter, Panda, scikit-learn, NumPy,NLTK

Relevant Coursework (Graduate Level)

math Probability Theory; Probability, Noise, and System Modeling; Linear Algebra; Graph Theory.
engineering Digital Imaging Mathematics; Pattern Recognition; Digital Image Processing; Remote Sensing Spectral Image Analysis.

Publication

L. Dorado-Munoz, D. Messinger, D. Bove: Integrating spatial and spectral information for enhancing spatial features in the Gough map of Great Britain. Journal of Cultural Heritage. Elsevier, 2018.
L.P. Dorado-Munoz, D.W. Messinger: Spatial-spectral Schroedinger embedding for target detection. Optical Engineering 56(9). SPIE, 2017.
L.P. Dorado-Munoz, D.W. Messinger: Initial study of Schroedinger eigenmaps for spectral target detection. Optical Engineering, 55(8). SPIE, 2016.
L.P. Dorado-Munoz, M. Velez-Reyes, A. Mukherjee, B. Roysam: A Vector SIFT Detector for Interest Point Detection in Hyperspectral Imagery. Geoscience and Remote Sensing, 50(11). IEEE Transactions, 2012.
L.P. Dorado-Munoz, D.W. Messinger: Schroedinger eigenmaps with knowledge propagation for target detection. Proceedings of SPIE 9840, 2016.
L.P. Dorado-Munoz, D.W. Messinger: Schrodinger Eigenmaps for spectral target detection. Proceedings of SPIE 9472, 2015.
L.P. Dorado-Munoz, D.W. Messinger, W. Czaja: Assessment of Schrodinger Eigenmaps for target detection. Proceedings of SPIE 9088, 2014.
L.P. Dorado-Munoz, D.W. Messinger, A.K. Ziemann: Target detection using the background model from the topological anomaly detection algorithm. Proceedings of SPIE 8743, 2013
L.P. Dorado-Munoz, M. Velez-Reyes: Ship Detection in MODIS imagery. Proceedings of SPIE 8048, 2011.
L.P. Dorado-Munoz, M. Velez-Reyes, A. Mukherjee, B. Roysam: Interest point detection for hyper-spectral imagery. Proceeding of SPIE 7334, 2009.

Academic Service

Reviewer of IEEE Transaction on Geoscience and Remote Sensing (2010-2018)
Reviewer of IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (2015-2018)
Committee Member of Master Thesis, Engineering Department-Instituto Tecnológico Metropolitano, Medellín-Colombia (2017)