Leidy Dorado-Munoz

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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

Experience

2016–2017 **Postdoctoral Researcher**, *Chester F. Carlson Center for Imaging Science*, Rochester Institute of Technology.

- Used a Pan-sharpening methodology for integrating spatial and spectral information of imagery of the ancient Gough map of Great Britain that enhanced faded spatial details with spectral dissimilarity of around 0.03 rad.
- Applied linear and non-linear manifold learning methods for the analysis of spatial details of the Gough map 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 a hyperspectral image using a graph-based embedding model (Schroedinger Eigenmaps) with detection rates of about 0.9 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.

Technical Skills

languages Matlab,IDL,Python,R programming

technologies ENVI, LaTeX, Jupiter, Panda, scikit-learn, NumPy,NLTK

Relevant Coursework (Graduate Level)

- Probability Theory
- Probability, Noise, and System Modeling
- Linear Algebra
- Graph Theory
- 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 hyperspectral 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 Observation and Remote Sensing (2015-2018)

Committee Member of Master Thesis, Engineering Department-Instituto Technologico Metropolitano, Medellin-Colombia (2017)