

# ANTHONY ORTIZ

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## RESEARCH INTEREST

My research interests lie in the intersection between computer vision, cybersecurity, remote sensing, and deep learning. I am particularly interested in the application of artificial intelligence to solve problems affecting society.

## EDUCATION

**University of Texas at El Paso, Computer Science Dept.**, El Paso, TX, USA  
*Ph.D. student, Computer Science*

- GPA: 4.0/4.0
- Advisor: Olac Fuentes, PhD. Co-Advisor: Christopher Kiekintveld, PhD

**Pontificia Universidad Catolica Madre y Maestra**, Santiago, D.R.  
*Bachelor of Science, Electrical and Computer Engineering*, 2014

- GPA: 3.8/4.0 (Top 1%)

## COMPUTER SKILLS

*Programming Languages:* Python, Matlab, C++, Java, C#, Octave  
*Misc:* Tensorflow, Pytorch, OpenCV, Keras, Theano, Scipy, Scikit-learn  
*Strong Background in:* Machine Learning, Computer Vision, Deep Learning, Remote Sensing

## EXPERIENCE

**University of Texas at El Paso, Intelligent Agents and Strategic Reasoning Laboratory (IASRL)**, El Paso, TX

*Research Assistant*

**August 2017 - Present**

- Work on adversarial machine learning. Developed attacks and defenses against non-RGB image-based machine learning systems. Proposed a novel defense to increase robustness on non-RGB image-based classifiers while improving performance by more than 12%. Paper accepted to CVPRW 2018.

**US Army Research Laboratory (ARL - West) & USC-ICT**, Playa Vista, CA  
*Visiting Research Assistant*

**Summer 2017**

- Collaboration with the USC Center for Artificial Intelligence in Society in the project “Machine Learning for Wildlife Conservation with UAVs” which objective is to protect elephants from poachers in Africa. This implied the creation of an object detection system to detect poachers and elephants from thermal videos collected using UAVs.
- Research in machine learning with state estimation and sensor modeling, deep learning, computer vision, hyperspectral image processing, and remote sensing for the Image Processing Branch of the US Army Research Lab. Journal paper under review (JSTAR)

**US Army Research Laboratory (ARL - West) & USC-ICT**, Playa Vista, CA  
*Visiting Research Assistant*

**Summer 2016**

- Research in the areas of computer vision, hyperspectral image processing and remote sensing. We solved the problem of automatically fusing hyperspectral data of a digitized scene with image-based 3D models, overlapping the same scene, in order to associate material spectra with corresponding height information for improved scene understanding. Conference paper accepted for oral presentation (IGARSS 2017)

**University of Texas at El Paso, Computer Science Dept.**, El Paso, TX  
*Ph.D. Teaching Assistant* **August 2015 - Present**

- Taught Elementary Data Structure and Introduction to Computer Science Laboratories.

**University of Texas at El Paso, Vision and Learning Lab**, El Paso, TX  
*Research Assistant* **August 2015 - Present**

- Worked on the areas of computer vision, and machine learning. Lead a team that developed algorithms to automatically detect and classify types of fish from images for “The Nature Conservancy Fisheries Monitoring” kaggle competition. Developed algorithms for semantic segmentation and object detection on satellite images. Mentored multiple undergraduate students.

**Advansys SRL**, Santiago, Dominican Republic  
*Software Engineer* **September 2014 - July 2015**

- Member of a team in charge of the complete redesign and development of the main software that this company sells. We used n-layer architecture, C# in the backend, WPF for the desktop version, and both SQL Server and Oracle for Databases management.

**Pontificia Universidad Catolica Madre y Maestra**, Santiago, D.R.  
*Undergraduate Research Assistant* **April 2014 - September 2014**

- Designed and developed an algorithm that provides visual identification about whether a geographical area contains specific mineral deposits within a target zone. First algorithm that use Landsat 8 multispectral images to identify gold using remote sensing and machine learning techniques.

- PUBLICATIONS**
- [1] Dalton Rosario, **Anthony Ortiz** and Olac Fuentes. 3D Terrain Segmentation in the SWIR Spectrum. *IEEE Workshop on Hyperspectral Image and Signal Processing Conference (IEEE WHISPERS 2018)*, Amsterdam, The Netherlands, 2018. (Submitted)
- [2] **Anthony Ortiz**, Alonso Granados, Olac Fuentes, Christopher Kiekintveld, Dalton Rosario and Zachary Bell. Integrated Learning and Feature Selection for Deep Neural Networks in Multispectral Images *14th IEEE Workshop on Perception Beyond the Visible Spectrum, held in conjunction with Conference on Computer Vision and Pattern Recognition (CVPR 2018)*, Salt Lake City, Utah, 2018.
- [3] Dalton Rosario and **Anthony Ortiz**. Spectral-elevation data registration using visible-SWIR spatial correspondence *SPIE Defense and Commercial Sensing (CVPR 2018)*, Orlando, Florida 2018.

[4] **Anthony Ortiz**, Dalton Rosario and Olac Fuentes. Robust 3D Terrain Segmentation into Key Materials for Improved Situational Awareness *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS)*, 2017. (Under Review)

[5] **Anthony Ortiz**, Dalton Rosario, Olac Fuentes and Simon Blair. Image-Based 3D Model and Hyperspectral Data Fusion for Improved Scene Understanding. *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Fort Worth, Texas, 2017. (Oral Presentation)

[6] Dalton Rosario, Christoph Borel, Ryan McAlinden, **Anthony Ortiz**, Sarah Shriver, Damon Conover and Blair Simon. Small Drone Field Experiment: Data Collection & Processing. *9th NATO Military Sensing Symposium, SET-241 (NATO)*, Quebec, Canada, 2017.

[7] **Anthony Ortiz**, Leonardo Lopez, Luis Francisco, Vladimir Del Rosario and Arlene Estevez. Use of Band Ratio Image Technique with Landsat 8 Satellite Images for Gold Remote Sensing in Dominican Republic. *Tenth International Scientific Research Congress*, Santo Domingo, 2014.

## AWARDS

- Good Neighbor Scholarship 2016-2017, 2017-2018. Texas Department of Higher Education
- Student Travel Grant. Graduate School, University of Texas at El Paso, 2017
- Anita Mochen Loya College of Engineering Graduate Fellowship, 2015 2016. UTEP College of Engineering, 2015
- Summa Cum Laude. Pontificia Universidad Catolica Madre y Maestra, 2010
- Diploma de Maxima Excelencia 2008-2009. Dominican Government
- Sixth place winner in the eighth national competition of physics, 2009
- First place winner in the regional competition of math, 2008

## RELEVANT COURSEWORK

- Image Processing
- Advanced Algorithms
- Data Mining
- Computer Vision
- Artificial Intelligence
- Remote Sensing
- Deep Learning
- Game Theory

## EXTRA-CURRICULAR ACTIVITIES

- IEEE Student Member
- Google IgniteCS volunteer