ANTHONY ORTIZ

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Bio

I am a principal research scientist manager at Microsoft's AI for Good research lab. I work at the intersection machine learning and computer vision and its application to remote sensing and geospatial machine learning. I co-lead Microsoft's Geospatial Machine Learning Center. I also do fundamental research on generalization, transfer learning, conditional computation, and domain adaptation.

EXPERIENCE

Microsoft, Redmond, WA, USA
Principal Research Scientist Manager, AI for Good Lab **June 2020 - Present**

- Work with external collaborators from different research institutions including University of British Columbia (UBC), University of Washington (UW), John Hopkins University, and Harvard University on medical imaging related projects
- Work with external collaborators including The Nature of Conservancy (TNC), the Smithsonian Institution, NOAA, UNHCR, HOTOSM, and the World Bank on geospatial machine learning projects
- Co-authored more than 40 research articles accepted in top conferences and journals including Nature Scientific Report, Journal of Nuclear Medicine, Nature Scientific Data, JAMA Open Network, CoRR, ECCV, CVPR, ICLR, NeurIPS, IGARSS, WACV, among others.

Orbital Insight, Palo Alto, CA, USA
Computer Vision Intern **June 2019 - August 2019**

- Successfully generated synthetic satellite image from semantic labels and metadata encoding using a variant Generative Adversarial Networks (GAN). Patent filed.

Microsoft Research, Redmond, WA, USA
AI Research Intern **March 2019 - June 2019**

- Advisors: Nebojsa Jojic, Dan Morris
- Research on machine learning, deep learning, and human-machine collaboration for efficient land cover mapping. Also worked closely with Microsoft AI for Earth using artificial intelligence to support NGOs. 2 papers accepted to AAAI 2020 and CVPR 2020.

Quebec Artificial Intelligence Institute (Mila), Montreal, QC, Canada
Visiting Researcher **September 2018 - March 2019**

- Advisor: Yoshua Bengio
- Research on deep learning for remote sensing. I am studying models generalization, spectral-spatial compositionality, and multiview image-based superresolution for satellite images. Started a collaboration effort between Intel AI, The American Red Cross, and Mila to map Uganda and support the Red Cross on disaster response.

University of Texas at El Paso, Intelligent Agents and Strategic Reasoning Laboratory (IASRL), El Paso, TX
Research Assistant **August 2017 - Present**

- Developed a deep learning architecture which jointly integrates learning and band subset selection for multispectral and hyperspectral imagery improving segmentation performance by more than 12%. 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.

US Army Research Laboratory (ARL - West) & USC-ICT, Playa Vista, CA
Visiting Research Assistant **Summer 2017**

- Research in machine learning with state estimation and sensor modeling, deep learning, computer vision, and remote sensing. Papers accepted to SPIE DCS and IEEE WHISPERS.

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)

EDUCATION

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

- Dissertation: Deep learning for Overhead Imagery: Algorithms and Applications.
- Advisor: Olac Fuentes. Co-Advisor: Christopher Kiekintveld
- Dissertation Committee: Olac Fuentes, Christopher Kiekintveld, Miguel Velez-Reyes, Nebojsa Jojic, Yoshua Bengio

University of Texas at El Paso, Computer Science Dept., El Paso, TX, USA
Master's Degree, **Computer Science**

- Advisor: Olac Fuentes

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

- Summa Cum Laude (Top 1%)

AWARDS

- Data Scientist of the Year, Microsoft, 2024
- CELA awards recipient in the category of *Solving Hard Problems*, Microsoft, 2023
- AAAI Travel Grant. Association for the Advancement of Artificial Intelligence (AAAI), 2020
- Microsoft AI for Earth Research Grant. Amount: US $18,000. Microsoft Corporation, 2019

- Student Travel Grant. Graduate School, University of Texas at El Paso, 2018
- 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 President
- Sixth place winner in the eighth national competition of physics, 2009
- First place winner in the regional competition of math, 2008

COMPUTER SKILLS

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

SELECTED NEWS COVERAGE

- *Here's What the Rise of Clean Energy Looks Like From Space.* The New York Times.
- *AI: The Guardian of the Amazon Rainforest.* AI Insider.
- *Exclusive: Satya Nadella, CEO of Microsoft, Explains How to Successfully Navigate the Age of Artificial Intelligence.* Forbes.
- *Now an AI model that identifies where solar farms are located in India.* Analytics Indian Magazine.
- *Satellites Are Spotting the Beached Whales We Never Would Have Found.* The Atlantic.
- *Microsoft researchers tap AI for anonymous data sharing for health care providers.* Venturebeat.
- *AI Emerges as Crucial Tool for Groups Seeking Justice for Syria War Crimes.* Wall Street Journal (WSJ).
- *Turkish Red Crescent restores the family links of refugees with AI for Humanitarian Action Program.* ICTMedia.

SELECTED PUBLICATIONS

1. Nsutezo, Simone Fobi, Duncan Kebut, Seema Iyer, Luana Marotti, Rahul Dodhia, Juan M. Lavista Ferres, and **Anthony Ortiz**. "PGRID: Power Grid Reconstruction in Informal Developments Using High-Resolution Aerial Imagery." 2025 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV). IEEE, (2025)
2. Corley, Isaac, Caleb Robinson, and **Anthony Ortiz**. "A change detection reality check." Preprint (2024)
3. **Anthony Ortiz**, Weiyushi Tian, Tenzing Chogyal Sherpa, Finu Shrestha, Mir Matin, Rahul Dodhia, Juan M. Lavista Ferres, and Kris Sankaran. "Mapping glacial lakes using historically guided segmentation models." IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 15 (2023).

4. **Anthony Ortiz**, Dhaval Negandhi, Sagar R Mysorekar, Joseph Kiesecker, Shivaprakash K Nagaraju, Caleb Robinson, Priyal Bhatia, Aditi Khurana, Jane Wang, Felipe Oviedo, Juan Lavista Ferres. "An Artificial Intelligence Dataset for Solar Energy Locations in India." Nature Scientific Data, 2022.
5. Roberto Garcia, **Anthony Ortiz**, Miguel Velez-Reyes. "Using an epitomic model for downscaling of GOES-16's land surface temperature product." Algorithms, Technologies, and Applications for Multispectral and Hyperspectral Imaging XXVIII, SPIE, 2022
6. Caleb Robinson, **Anthony Ortiz**, Hogeun Park, Nancy Lozano, Jon Kher Kaw, Tina Sederholm, Rahul Dodhia, Juan M. Lavista Ferres. "Fast Building Segmentation From Satellite Imagery and Few Local Labels." Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2022, pp. 1463-1471
7. Stewart, Adam J., Caleb Robinson, Isaac A. Corley, **Anthony Ortiz**, Juan M. Lavista Ferres, and Arindam Banerjee. "TorchGeo: deep learning with geospatial data." Proceedings of the 30th International Conference on Advances in Geographic Information Systems. 2022.
8. N. Jojic, N. Malkin, C. Robinson and **A. Ortiz**, "From Local Algorithms to Global Results: Human-Machine Collaboration for Robust Analysis of Geographically Diverse Imagery," 2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS, 2021, pp. 270-273, doi: 10.1109/IGARSS47720.2021.9554869.
9. Ivan Klyuzhin, Yixi Xu, Sara Harsini, **Anthony Ortiz**, Carlos Uribe, Juan Lavista Ferres, and Arman Rahmim. "Unsupervised background removal by dual-modality PET/CT guidance: application to PSMA imaging of metastases." Journal of Nuclear Medicine (2021): 36-36.
10. Kshirsagar, M., Robinson, C., Yang, S., Gholami, S., Klyuzhin, I., Mukherjee, S., Nasir, M., **Ortiz, A.**, Oviedo, F., Tanner, D. and Trivedi, A., "Becoming Good at AI for Good." AIES 2021
11. Robinson, Caleb, **Anthony Ortiz**, Juan M. Lavista Ferres, Brandon Anderson, and Daniel E. Ho. "Temporal Cluster Matching for Change Detection of Structures from Satellite Imagery." Proceedings of the 4th ACM SIGCAS Conference on Computing and Sustainable Societies. (2021).
12. Rajotte, Jean-Francois, Sumit Mukherjee, Caleb Robinson, **Anthony Ortiz**, Christopher West, Juan Lavista Ferres, and Raymond T. Ng. "Reducing bias and increasing utility by federated generative modeling of medical images using a centralized adversary." Proceedings of the conference on information Technology for Social Good (2021).
13. Robinson, C., Trivedi, A., Blazes, M., **Ortiz, A**., Desbiens, J., Gupta, S., Dodhia, R., Bhatraju, P.K., Liles, W.C., Lee, A. and Kalpathy-Cramer, J., 2021. "Deep learning models for COVID-19 chest x-ray classification: Preventing shortcut learning using feature disentanglement." PlOS One (2021).
14. **Anthony Ortiz**, Anusua Trivedi, Jocelyn Desbiens, Caleb Robinson, Marian Blazes, Sunil Gupta, Rahul Dodhia et al. "Effective Deep Learning Approaches for Predicting COVID-19 Outcomes from Chest Computed Tomography Volumes." Nature Scientific Reports (2021).
15. Alonso Granados, Mohammad Sujan Miah, **Anthony Ortiz**, and Christopher Kiekintveld, "A Realistic Approach for Network Traffic Obfuscation using Adversarial Machine Learning," in *Conference on Decision and Game Theory for Security* (GameSec 2020)

16. Kolya Malkin, **Anthony Ortiz**, and Nebojsa Jojic, "Mining self-similarity: Label super-resolution with epitomic representations," in *Proceedings of the 2020 European Conference on Computer Vision* (ECCV 2020)
17. **A. Ortiz**, C. Robinson, D. Morris, O. Fuentes, C. Kiekintveld, M. M. Hassan, and N. Jojic, "Local Context Normalization: Revisiting Local Normalization," in *Proceedings of the 2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition* (CVPR 2020), Seattle, WA, 2020 (Oral)
18. Caleb Robinson, **Anthony Ortiz**, Kolya Malkin, Blake Elias, Andi Peng, Dan Morris, Bistra Dilkina, and Nebojsa Jojic. "Human-Machine Collaboration for Fast Land Cover Mapping." *Association for the Advancement of Artificial Intelligence Conference* (AAAI 2020), New York, NY, 2020
19. 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.

    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.
20. **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.

MENTORING

- Isaac Corley, Research Scientist, WeRobotics.
- Aryal Bibek, Software Engineer, Microsoft
- Alonso Granados, PhD Student, University of Arizona
- Zachary Bell, Senior Software Engineer, USAA
- Gerardo Uranga, Software Engineer, Walt Disney. Before: Microsoft, Docusign.

EXTRA-CURRICULAR ACTIVITIES

- LatinX in AI board member
- IEEE Student Member
- Climate Change Artificial Intelligence (CCAI) member
- Reviewer for AAAI, NeurIPS, CVPR, IGARSS, CVPR, ICCV, ICLR, among others.