

RAMON LUIS CORREA-MEDERO

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EDUCATION

Arizona State University Ph.D student in Data Science, Analytics, and Engineering	2021-Current
Emory University[Transferred] Ph.D student in Computer Science	2019-Transfer
Case Western Reserve University B.S Biomedical Engineering Minor Computer Science	2014-2019

RESEARCH EXPERIENCE

Causal techniques reduce biases in Vision Language Foundation Models	A3I Hub@Mayo Clinic 2023-Ongoing
<ul style="list-style-type: none">Implemented causal methods to estimate unknown confounding in screening mammogram populations. Allowing adaptation of VLM model to reduce biases in downstream applications.Reduced hospital-level disparities in recurrence prediction from histopathology images by using causality-inspired techniques to train models using features from VLMs.	
Domain Generalization Improves Characterization of Kidney Health	A3I Hub@Mayo Clinic Aug 2021-Ongoing
<ul style="list-style-type: none">Developed novel domain adaptation technique to improve robustness of segmentation models robustness to variation in organ appearance caused by disease.Leveraged Google Vertex AI, Big Query, and Google Cloud Health API to curate datasets and train and evaluate imaging-based models to estimate differential kidney function.	
Improving Adversarial Learning for Fair and effective Medical AI	A3I Hub@Mayo Clinic 2021-2023
<ul style="list-style-type: none">Implemented novel debiasing techniques utilizing interpretability techniques and adversarial learning to reduce model disparities across use cases in screening mammography, chest x-ray disease, and skin lesion classification.	
Virtual Biopsy of Brain Tumors using AI and radiomics	BRIC Lab@CWRU Summer 2016-Spring 2019
<ul style="list-style-type: none">Applied segmentation models to extract radiomic features to non-invasively derive insights from the tumor micro-environment using imaging.Built models to predict treatment response and estimate the risk of tumor recurrence from routine MRI for brain cancer patients.	

WORK EXPERIENCE

MD.AI: Research Engineering Intern	May 2022-Aug 2022
<ul style="list-style-type: none">Improved MRI-based model robustness to distribution shifts by applying data harmonization techniques.Increased the reliability of PHI detection on x-ray scans by augmenting model training.	
Alphacore: AI Engineer (Consultant)	January 2024-July 2024
<ul style="list-style-type: none">Reduced data storage needs by developing an autoencoder model to compress time series geo-sensor measurements.Developed autoencoder inspired by Meta's encodec model to compress sensor data by incorporating custom frequency and adversarial losses.	

SKILLS AND TOOLS

- **Programming Languages:** Python, Java, Matlab, & Bash
- **Libraries:** Pytorch, Tensorflow, Pandas, Numpy, & Scikit-learn
- **Tools:** Docker, BigQuery, & Git
- **Platforms:** Google Vertex AI & Linux

SERVICES

- **Reviewer:** The Visual Computer Journal, Nature Scientific Reports

PUBLICATIONS

Conference Papers

1. **Correa, R.** *Comparative analysis of multiphase CT volumetric kidney segmentation: fine-tuning to domain adaptation* in *Medical Imaging 2024: Computer-Aided Diagnosis* (eds Astley, S. M. & Chen, W.) (SPIE, San Diego, United States, Apr. 2024), 123. ISBN: 978-1-5106-7159-1.
2. **Correa, R.** *A robust two-step adversarial debiasing with partial learning - medical image case-studies* in *SPIE Medical Imaging 2023: Computer-Aided Diagnosis* (2023).
3. **Correa, R. L.**, Patel, B., Banerjee, I., *Adversarial Debiasing techniques towards ‘fair’ skin lesion classification* in *2023 11th International IEEE/EMBS Conference on Neural Engineering (NER)* (2023), 1–4.
4. **Correa, R.** *Lesion-habitat radiomics to distinguish radiation necrosis from tumor recurrence on post-treatment MRI in metastatic brain tumors* in *SPIE Medical Imaging 2020: Computer-Aided Diagnosis 11314* (2020), 1131430.

Journal Articles

5. **Correa, R.**, Jeong, J., Patel, B., Banerjee, I., Abdul-Muhsin, H., *Automated Analysis of Split Kidney Function from CT Scans Using Deep Learning and Delta Radiomics*. *Journal of endourology* (May 2024).
6. **Correa, R.** *Efficient adversarial debiasing with concept activation vector — Medical image case-studies*. *Journal of Biomedical Informatics* **149**, 104548. ISSN: 15320464 (Jan. 2024).
7. **Correa-Medero, R. L.** *Causal Debiasing for Unknown Bias in Histopathology - A Colon Cancer Use Case*. *Plos One(Accepted)* (2024).
8. Jeong, J. *The EMory BrEast imaging Dataset (EMBED): A Racially Diverse, Granular Dataset of 3.4 Million Screening and Diagnostic Mammographic Images*. English (US). *Radiology: Artificial Intelligence* **5**. Publisher Copyright: © 2023 Radiological Society of North America. ISSN: 2638-6100 (Jan. 2023).
9. **Correa, R.** *A Systematic Review of ‘Fair’ AI Model Development for Image Classification and Prediction*. en. *Journal of Medical and Biological Engineering* **42**, 816–827. ISSN: 2199-4757 (Dec. 2022).
10. Gichoya, J. W. *AI recognition of patient race in medical imaging: a modelling study*. *The Lancet Digital Health* **4**, e406–e414. ISSN: 2589-7500 (2022).

Workshops

11. **Correa, R.** *Domain adaptation for contrast-agnostic CT volumetric kidney segmentation* in *LatinX in AI (LXAI) Research at ICML 2024* (2024).
12. **Correa, R.** *Two-step adversarial debiasing with partial learning – medical image case-studies* in *AAAI 2022:Trustworthy AI Workshop* (2022).