Ramon Luis Correa-Medero

rlcorrea@asu.edu • +1 (787)-585-1916 • Google Scholar

Education

Arizona State University 2021-Current
Ph.D Data Science, Analytics, and Engineering

Case Western Reserve University 2014-2019
BS Biomedical Engineering Minor:Computer Science

Research Experience

Causal Learning Mitigates Hidden Biases in Vision Language Models A3I Hub@**Mayo Clinic** 2023-Ongoing

- Implemented causal methods to estimate unknown confounding in VLM's used for screening mammography applications. Leveraged confounding estimates to reduce disparities in downstream applications.
- Reduced hospital-level disparities in colon cancer recurrence prediction from histopathology images by applying causality-inspired techniques to pathology-based VLM.

Domain Generalization Improves Characterization of Kidney Health A3I Hub@**Mayo Clinic** Aug 2021-Ongoing

- Developed novel domain adaptation technique to improve the robustness of segmentation models to variation in organ appearance caused by disease.
- Leveraged Google Vertex AI, Big Query, and Google Cloud Health API to curate datasets, train, and evaluate imaging-based models to estimate differential kidney function.

Adversarial Learning for Fair Medical AI A3I Hub@**Mayo Clinic** 2021-2023

- Implemented novel debiasing method combining tensor concept activations and adversarial learning. Reduced model classification disparities across use cases in screening mammography and skin lesion classification.

Virtual Biopsy of Brain Tumors Using AI and Radiomics BRIC Lab@**CWRU** Summer 2016-Spring 2019

- 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

- Evaluated site-level performance of MRI series classification models, identifying centers where model underperformed.
- Implemented data harmonization techniques for model training and evaluation, improving model robustness across centers.
- Implemented text augmentations during model training, improving the ability to detect PHI from X-rays.

Alphacore: AI Engineer Jan 2024-Jul 2024

- Implemented time series autoencoder model for the compression of geo-sensor data. Reducing data storage cost.
- Further improved the quality of data compression by including frequency domain constraints to model training.
- Trained models using compressed sensor data to identify abnormal events such as earthquakes and explosions.

Skills and Tools

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

Services

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

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,* 2 (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).