Andres G. Gomez

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EDUCATION

Master of Science in Electrical and Computer Engineering Graduation: Spring 2024
University of Florida, Gainesville, FL GPA: 3.75

Bachelor of Science in Electrical Engineering and Physics Graduated: May 2020
Florida International University, Miami, FL

PROFESSIONAL EXPERIENCE

Research Assistant, Artificial Intelligence and Medical Image Analysis Feb 2023 – Present
UF Department of Medicine, Dr. Wei Shao

- Designed and executed large-scale experiments to fine-tune segmentation models, leveraging multiple medical datasets, diverse augmentation approaches, and various layer freezing techniques
- Applied and compared performance of prominent classification models for image-based lung cancer and lung-related condition detections in chest CT scans
- Incorporated morphological image processing techniques to refine and clean up segmentation predictions, enhancing the quality of results
- Diligently studied and analyzed state-of-the-art model papers and advanced data augmentation techniques, delivered informative presentations to the research group.

Medical Physics Assistant, Proton and Photon Physics June 2020 – April 2022
Miami Cancer Institute, Baptist Health South Florida

- Collaborated on in-depth clinical physics research projects, conducted literature searches, designed experiments, collected and analyzed data, and delivered presentations on findings
- Designed and developed 3D-printed dose verification devices, performed modifications to existing equipment, and wrote scripts to automate and streamline clinical operations, enhancing efficiency
- Performed comprehensive patient specific quality assurance (QA), film and ion chamber measurements for treatment plan dose verification on photon and proton modalities
- Conducted regular daily, monthly and annual inspections to evaluate machine performance, ensuring optimal functionality and adherence to quality standards

Academic Coach, Math and Physics March 2017 – June 2020
Center for Academic Success, FIU

- Developed creative examples and clearly communicated complex topics to in both classroom settings (60+ students) and individualize tutoring
- Identified common misconceptions and catered examples to improve student's understanding/approach
- Attended academic seminars and stayed up to date on latest research regarding pedagogy

Research Assistant, Medical Device Research and Development May 2019 – Sept 2019
FIU Biomedical Engineering Department, Dr. Anuradha Godavarty

- Independently developed and tested a near-infrared optical imaging device to better model and quantify the assessment of diabetic skin ulcers
- Conducted literature searches, created test methods to extract and analyze performance data, prepared visualizations, and clearly presented findings to research group

Research Assistant, Analog Circuit Design and Analysis Sept 2017 – June 2018
FIU Physics Department, Dr. Brian Raue

- Reverse engineered PCBs to reconstruct their schematics and leveraged quantitative techniques and simulation software to assess their functionality
- Designed, prototyped, troubleshot, and tested analog circuit designs, including passive and active filters, using simulation tools, oscilloscopes, and function generators

ACADEMIC PROJECT EXPERIENCE

Adaptive Affect-Aware Learning Assessment System, UF Aug 2023 – Present

- Conducted an in-depth literature review and partnered with Dr. Catia Silva to conceptualize and design an innovative educational assessment tool correlating user affective mannerisms with performance
- Led the development of a large-scale software system tailored for research purposes, showcasing proficiency in system architecture and software engineering
- Applied MediaPipe to extract key features, including facial expressions, pose estimations, and hand landmarks, contributing to the comprehensive functionality of the tool
- Authored and submitted abstracts and papers for conference presentations, exemplifying effective communication of research findings to the academic community

Distracted Driver Image Classification, UF Sept 2022 – Dec 2022

- Classified images of drivers as alert or distracted using convolutional neural networks (CNN)
- Trained and tested multiple CNN frameworks to obtain classification accuracies of over 96%
- Tested various optimization metrics and determined binomial proportion confidence intervals for false positives

Traffic Sign Image Classification, UF May 2022 – Aug 2022

- Utilized transfer learning to train CNNs to classify multiple classes of traffic signs with over 97% accuracy
- Collaborated with a team to collect images of traffic signs, design experiments, and document results
- Performed literature searches, designed, and tested several shallow and deep learning architectures

COMPUTER/TECHNICAL SKILLS

Software: Jupyter Notebook, GitHub, MATLAB, AutoCAD, Microsoft Suite
Programming/Scripting Language Experience: Python, C++, SQL, Linux
Libraries: Scikit-learn, TensorFlow, Pytorch, PIL, OpenCV, NumPy, Pandas, SciPy

PUBLICATIONS

1. Peer reviewed abstract - accepted: **A Gomez**, C Silva. Adaptive affect-aware multimodal learning system for learning American sign language. 2024 ASEE Annual Conference & Exposition, November 2023.
2. Peer reviewed poster - accepted: **A Gomez**, M Leyva, L Coutinho. Preliminary Investigation of the Dosimetric Impact of Common Dental Restorative Materials on Proton Beams. AAPM Virtual 63rd Annual Meeting, July 2021.
3. Peer reviewed poster - accepted: **A Gomez**. Utility of 3D Printer In Brachytherapy to Fabricate End-To-End Testing Phantoms For Multiple Purposes. AAPM Spring Clinical Meeting 2022
4. Peer reviewed published: D Doty, M Choung, **A Gomez**, Stereotactic MR-guided online adaptive radiotherapy reirradiation (SMART reRT) for locally recurrent pancreatic adenocarcinoma: A case report. Med Dosim. 2021
5. Peer reviewed poster - accepted: S George, J Contreras, **A Gomez**. Syed Template for Interstitial HDR_ A 3D Printed Alternative. American Association of Physicists in Medicine. 2021