CARLOS CANO ESPINOSA, PH.D.

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EDUCATION

PhD in Computer Science
University of Alicante, Spain *2019*

- Internship grant at Harvard Medical School,
  Brigham and Womens Hospital Radiology Department, MA, USA.
  Project: Coronary Artery Disease biomarker computation algorithms from non-ECGGated CT scans.
- Thesis: Image-Based Biomarker Localization from Regression Networks.

MsC in Robotic Engineering
University of Alicante, Spain *2015*

- Computer Vision, Perception, Advanced Automation.
- Dissertation: Multihull Autonomous Surface Marine Drone.

Computer Engineering
University of Alicante, Spain *2014*

- 5-years university program.
- Project: Integrated Autonomous Ship Navigation and Control System

Certificate in Medical Computing
University of Alicante, Spain *2011*

- Specialization program.
- Image Analysis, Clinical Decision Support Systems, Healthcare Technology.

EXPERIENCE

University of Alicante Sep 2023 - Present
Adjunct Associate Professor *Alicante, Spain*

- Teaching C, Scheme and Swift as member of the Department of Computer Science and Artificial Intelligence.

Mecánicas Bolea Oct 2024 - Mar 2025
Principal AI Engineer *Cartagena, Spain*

- Application and Implementation of AI Models in Shipbuilding Manufacturing.
- Leveraging AI to optimize shipbuilding processes through advanced control dimension management.
- Focused on reducing tolerances, improving precision, and minimizing energy consumption, resulting in more efficient and sustainable manufacturing practices.

Universidad Politécnica de Cartagena Jun 2023 - Sep 2024
Post-Doctoral Researcher *Cartagena, Spain*

- Funded by the María Zambrano Talent Attraction Grant.
- Spearheading the development of innovative neural network-based algorithms for the automatic detection and classification of keratoconus, focusing on enhancing diagnostic precision and treatment efficacy in ophthalmology.

Harvard Medical School / Brigham and Women's Hospital April 2021 - April 2023
Research Fellow *Boston, USA*

· Post-Doctoral Researcher at Applied Chest Imaging Laboratory.
· Multiple Medical image modalities: CT, MRI, PET.
· Generative Models for Metabolical activation signal quantification.
· Automated Detection of Airway-Occluding Mucus Plugs.

Fisabio foundation July 2020 - January 2021
Researcher *Alicante, Spain*

· Engineered an AI-driven diagnostic and triage tool for COVID-19 patients, utilizing clinical-radiological data to optimize patient management and predict outcomes during the pandemic.
· Automated detection of Pulmonary Infiltrates on X-rays.
· Classification of COVID-19 Pathology Using X-ray Images.

Timiaktech December 2019 - Jun 2022
Lead Data Scientist *Murcia, Spain*

· Developed and implemented cutting-edge image analysis methodologies using neural networks, aimed at improving the performance and functionality of optical diagnostic devices.

University of Alicante November 2018 - December 2019
Researcher *Alicante, Spain*

· Focused on developing advanced neural network models to enhance web development processes. Key contributions include:

- Automated detection of design issues.
- Predicted human visual perception ratings.
- Enhanced model interpretability for improved user experience.
- Model interpretability.

University of Alicante April 2017 - July 2017
AI Consultant *Alicante, Spain*

· Intelligent systems for automatic human emotions detection and others behaviors/expressions.

Sierra Research January 2017 - November 2018
AI Consultant *Alicante, Spain*

· Computer Aided Detection for Pulmonary Embolism
· Sparse auto-encoder algorithms for bind source deconvolution.
· Human activity and posture kinetics classification.

SmartUA November 2015 - April 2017
Main developer *Alicante, Spain*

· Hardware and Backend Developer/Lead for the Smart University Project.
· Design and Deployment of environmental Sensors and Data Capture Systems.
· Server management: Configuration, maintenance, monitoring, security, and backups.

University of Alicante's Data Processing Center September 2013 - July 2015
Technical Assistant *Alicante, Spain*

· Maintenance and monitoring the network infrastructure of the University of Alicante.
· Signal quality maps generation and interpretation.
· Software development.
· User assistant and problems resolution.

TECHNICAL SKILLS

- **Programming Languages:** Python, C/C++, C#, Java, SQL, MATLAB, R.
- **Data Analysis and Visualization:** Pandas, NumPy, SciPy, Matplotlib, Seaborn
- **Machine Learning and AI:** TensorFlow, Keras, PyTorch, Scikit-learn, OpenCV
- **Medical Image Analysis:** ITK, VTK, SimpleITK, DICOM
- **Tools and Platforms:** Git, Docker, Kubernetes, AWS, Azure, Google Cloud

RESEARCH

Automated Detection of Airway-occluding Mucus Plugs From Non-contrast CT
P Nardelli, C Cano-Espinosa, R San Jose Estepar, AA Diaz, R San Jose Estepar
American Thoracic Society 2024/5, A5230-A5230

Multi-site, multi-domain airway tree modeling
Minghui Zhang et al. (including Carlos Cano Espinosa)
Medical Image Analysis, Volume 90, December 2023, 102957

Umls-chestnet: A deep convolutional neural network for radiological findings, differential diagnoses and localizations of covid-19 in chest x-rays
Germán González et al. (including Carlos Cano Espinosa)
arXiv preprint arXiv:2006.05274

Computer Aided Detection of Pulmonary Embolism Using Multi-Slice Multi-Axial Segmentation
Carlos Cano-Espinosa, Miguel Cazorla, Germán González
Appl. Sci. 2020, 10, 2945

Computer Aided Detection for Pulmonary Embolism Challenge (CAD-PE)
Germán González, Daniel Jimenez-Carretero, Sara Rodrguez-Lpez, Carlos Cano-Espinosa, Miguel Cazorla et al.
arXiv preprint arXiv:2003.13440

Biomarker Localization from Deep Learning Regression Networks
Carlos Cano-Espinosa, G González, George R. Washko, Miguel Cazorla, Raúl San José Estépar
IEEE Transactions on Medical Imaging

Image-Based Biomarker Localization from Regression Networks
Carlos Cano-Espinosa
Thesis, University of Alicante Institutional Repository

Localizing Image-Based Biomarker Regression Without Training Masks: A New Approach to Biomarker Discovery
Carlos Cano-Espinosa, Germán González, George R. Washko, Miguel Cazorla, Raúl San José Estépar
2019 IEEE 16th International Symposium on Biomedical Imaging

On the relevance of the loss function in the agatston score regression from non-ecg gated ct scans
Carlos Cano-Espinosa, Germán González, George R. Washko, Miguel Cazorla, Raúl San José Estépar
MICCAI, Thoracic Image Analysis 2018

Automated Agatston Score Computation in non-ECG Gated CT Scans Using Deep Learning
Carlos Cano-Espinosa, Germán González, George R. Washko, Miguel Cazorla, Raúl San José Estépar
SPIE Medical Imaging 2018