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Santiago Calderón-Peña

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EDUCATION

MSc in Advanced Computing / Computer Science, *King's College London*   **Sep 2023 — Jan 2025**
London, United Kingdom

- **Thesis:** Real-Time Incremental Explanations and Saliency Maps for Object Detection in Videos (Awarded 94/100), supervised by Prof. Hana Chockler.
- Awarded with Distinction.
- Colfuturo Scholarship: Ranked 4th, placing in the top 0.5% of 779 candidates.
- Relevant Modules: Computer Vision, Neural Networks and Deep Learning, Data Mining, Agents and Multi-Agent Systems.
- Extracurriculars: Volunteered as a Research Assistant in Explainable AI, Lead in the Google Developers Student Club (GDSC) at King's College London.

Mechatronics Engineering, *Universidad Militar Nueva Granada*   **Jan 2017 — Apr 2022**
Bogotá, Colombia

- **Thesis:** Design and implementation of nonlinear controllers for a 3D printing system with continuous motors modeled as a Cartesian robot (Awarded 5.0/5.0).
- Full scholarship awarded by the Colombian Ministry of Information Technologies and Communications.
- Cum Laude: Highest GPA (4.54/5.0).
- "Tesis Laureada" - Thesis awarded with the highest honors.
- University Medal for academic merit.
- 5x "Matrícula de Honor" for achieving the highest semester GPA.
- Extracurriculars: Member of the Davinci research group, university karate team (multiple medals in university-level championships).

ACADEMIC EXPERIENCE

Research Assistant   **Sep 2023 — Present**
King's College London
London, United Kingdom

- Conducting research in Explainable AI (XAI), with contributions to peer-reviewed white papers submitted to top-tier AI conferences.
- Developing and optimizing XAI algorithms for computer vision tasks, focusing on real-time, causality-based methods (ReX and IncX), using PyTorch and ONNX, and automating research workflows with GitHub Actions.
- Actively collaborating in deep-dive research sessions to refine methodologies and ensure alignment with emerging AI trends.

Teaching Assistant   **Aug 2020 — Jun 2021**
Universidad Militar Nueva Granada
Bogotá, Colombia

- Contributed to the development of a control theory textbook using LaTeX.
- Assisted in the instruction of the Mechatronic Systems Models module (2020-II, 2021-I), delivering tutorials and providing support to small groups of students.

PUBLICATIONS

Real-Time Incremental Explanations for Object Detectors (Under Review)
Calderón-Peña S., Chockler H., Kelly D. A.
arXiv Preprint

Black-Box Explainability for Image Classifiers in a Medical Setting (Under Review)
*Blake N., Kelly D. A., Chockler H., **Calderón-Peña S.,** Chanchal A.*
ResearchSquare Preprint

ENGINEERING EXPERIENCE

Software Engineer - ML   **Jan 2025 — Present**
Linqia (American start-up specializing in data analysis for influencer marketing using AI)
(Remote position)

- Applied large language models (LLMs) for clustering and topic modeling, driving enhanced insights into marketing campaign data.

Software Engineer   **Dec 2022 — Dec 2024**
Quorum Software (US-based company providing software solutions for the oil and gas industry.)
Bogotá, Colombia, later relocated to London, United Kingdom (Hybrid position)
- Led a large-scale text classification project, comparing traditional NLP methods with advanced fine-tuned BERT-like models, and utilized SHAP for model explainability, boosting stakeholder confidence.
- Developed a generative AI application leveraging Azure AI Search and OpenAI (GPT-4) for Retrieval Augmented Generation (RAG), integrating LLM APIs to deliver impactful AI solutions to global teams in Norway, South Africa, and the U.S.

Junior Software Developer   **Mar 2022 — Oct 2022**
Kin + Carta (Global IT consulting firm)
(Remote position)
- Built and deployed Java RESTful APIs on Google Cloud Platform (GCP), optimizing automation workflows to enhance decision-making and improve operational efficiency.

TECHNICAL SKILLS

- **Machine Learning & Data Science:** PyTorch, TensorFlow, Keras, Scikit-Learn, NumPy, Pandas, SpaCy

- **Cloud Platforms:**

    – **Azure:** Azure ML, AI Services, Blob Storage, SQL Database, Serverless, Event Grid, Active Directory
    – **AWS:** RDS, Lambda, SNS, SQS
    – **GCP:** Cloud Run, SQL, Spanner, Firestore, Compute Engine

- **DevOps & Containerization:** Docker, Kubernetes

- **Version Control:** Git, GitHub

- **Backend Development:** Python (FastAPI), .NET (C#), Java (Spring)

- **Databases:** SQL Server, MySQL, Azure Cosmos DB

- **Research & Documentation:** LaTeX, Mendeley

CERTIFICATIONS

Microsoft Certified DP-100: Azure Data Scientist Associate, *Microsoft*
Credential id: *E0BEA56FD07E8AB7*

Microsoft Certified AI-102: Azure AI Engineer Associate, *Microsoft*
Credential id: *E5960BE874975467*

Google Cloud Certified - **Associate Cloud Engineer**, *Google Cloud*
Credential id: *63393547*

LANGUAGES

- **English**: TOEFL Score: 111/120 **(C2)**

- **Spanish**: Native Speaker

- **French**: DELF B2 Certified **(B2)**

- **German**: Proficiency Level **(B1)**

- **Italian**: Proficiency Level **(A2)**

VOLUNTEERING

Web Dev Student Lead   **Sep 2023 — Mar 2024**
Google Developer Students Club - King's College London

- Led a workshop on MLOps in Google Cloud, demonstrating how to use Vertex AI to automatically train and deploy a neural network for digit recognition using the MNIST dataset.
- Conducted a session on applying Vertex AI APIs for industry applications, including text-to-speech, speech-to-text, and face recognition.
- Presented on developing APIs with Flask for natural language processing (NLP) tasks, such as lemmatization and named entity recognition using spaCy.

Computer Skills Education Volunteer   **Jul 2022 — Jun 2023**
Fundación Laudes Infantis

- Taught basic robotics to children in low-income areas of Bogotá, empowering dozens of individuals with hands-on STEM skills.
- Provided foundational education in JavaScript and HTML to adolescents and adults, helping them build websites to support their entrepreneurial ventures.