


# CAMILO PESTANA

AI/ML & DATA SCIENCE LEADER (HANDS-ON) | ENTERPRISE GENAI & AGENTIC TRANSFORMATION ON AWS | IEEE-PUBLISHED RESEARCHER

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 Perth, Western Australia

## EDUCATION

### PhD in Computer Science (AI)

University of Western Australia ·  
Perth, Australia

2019 - 2022

Thesis on non-traditional adversarial machine learning for computer vision. ACS Medal Finalist. Top 5 PhD Thesis (WA). Five IEEE publications (CVPR, WACV, 3DV, IJCNN) on attacks, defences, and 3D adversarial textures.

### Hons. Computer Science, First Class, High Distinction

Edith Cowan University

2017

Dean's List. Top 5% Science School. Thesis: "Influenza like illness (ILI) modelling by analysing of geotagged twitter data". Developed a model that predicted influenza infection counts across Australian regions with up to 83% precision from social media events.

### BSc Software & Systems Engineering

Catholic University of Colombia

2007-2013

Thesis: Designed and analysed SGIPVIS, a web information system that links environmental, social, and economic criteria (temperature, humidity, density, material costs) to improve social housing prototypes in Bogotá. Built with XP agile methodology as part of an interdisciplinary architecture + software engineering research project. [\[Link\]](#)

## SUMMARY

AI/ML and Data Science leader who stays hands-on, technical enough to design enterprise GenAI and multi-agent systems, set evaluation standards, and write the Python behind them. My path runs Software Engineer to Data Scientist to ML to AI leader, so I advise on strategy while still owning the architecture. PhD in AI (UWA, 2022) in adversarial machine learning, with five IEEE publications (CVPR, WACV, 3DV, IJCNN) and a DARPA-funded research record. 15 years in tech, 10 turning research problems into production AI across Finance, MedTech, Defense, Oil & Gas, and Gaming. Australian Global Talent Visa recipient.

Currently Head of Data Science & ML at VGW (1,500 employees, \$7.3B USD revenue), where I own AI/ML strategy and governance and take high-stakes use cases from prototype to enterprise-scale production. I productionised multi-agent GenAI on AWS Bedrock with LangGraph orchestration, tool-calling, state management, and Guardrails, shipped a fraud detection model that generated \$230M+ USD ROI in year one, and led a cloud-native modernisation from legacy Databricks to AWS (SageMaker, Bedrock, S3 Tables, MSK, Apache Iceberg). I translate complex business problems into scalable AI solutions, scope capability uplift roadmaps, and present risk and investment trade-offs to the CTO and board. Earlier roles span solution architecture for enterprise clients, delivery against regulatory constraints (FDA-cleared models), and consulting-grade software at Globant for clients like Southwest Airlines and Bank of Bogota. I lead research scientists, ML engineers, and data scientists and partner directly with stakeholders at every level.

## PROFESSIONAL EXPERIENCE

### HEAD OF DATA SCIENCE & ML

Oct 2025 - Present

Virtual Gaming Worlds (VGW), Revenue FY2025: \$7.3B USD | Perth, Australia

Promoted to unify AI/ML Engineering and Data Science into one enterprise function. Own strategy, governance, and delivery across all AI/ML investment for the company.

- Defined AI governance standards across the enterprise: evaluation requirements, safety reviews for new GenAI use cases, model approval gates, and incident response. Sit on the central security function as AI subject matter expert
- Advise the CTO and the board on AI strategy, risk, and investment priorities. Translate technical risk into business language for executive decision making
- Productionised multi-agent GenAI on AWS Bedrock: LangGraph orchestration, tool-calling, state management, and Guardrails, moving agents from prototype to governed enterprise operations
- Built and shipped a production fraud detection model for the United Slots launch in 4 weeks, removing initial fraud exposure from day one
- Lead end-to-end modernisation from legacy Databricks to AWS (SageMaker, Bedrock, S3 Tables, MSK) with Apache Iceberg as open table format, and mentor research scientists, ML engineers, and data scientists across the function

## PORTFOLIO & PROJECTS

### AI Security (Open Source)

Open-source course on AI Security: ML/LLM vulnerabilities, prompt injection, adversarial ML defences.  
[github.com/elcronos/AISecurity](https://github.com/elcronos/AISecurity)

### AI Course Website

Open-source self-guided AI course: fundamentals, ML, deep learning, and modern GenAI workflows.  
[elcronos.github.io/ai-course-website](https://elcronos.github.io/ai-course-website)

### Tarsa (Agent Observability)

Observability layer for Claude agents: tracing, run inspection, and eval telemetry.  
[elcronos.github.io/tarsa/](https://elcronos.github.io/tarsa/)

### Agentic & GenAI Projects

Three multiplayer games shipped with spec-driven development, Ralph Loops, and subagents; images and SFX fully AI-generated.  
[github.com/elcronos/agentic](https://github.com/elcronos/agentic) ·  
[capcarde.itch.io/alien-waves](https://capcarde.itch.io/alien-waves) ·  
[capcarde.itch.io/inkwell-dice](https://capcarde.itch.io/inkwell-dice) ·  
[capcarde.itch.io/slot-crawler](https://capcarde.itch.io/slot-crawler)

### Data Science & ML Course in Oil & Gas

Contributor to the first open-source DS and ML Course in the Oil & Gas industry.  
[github.com/3springs/deep\\_ml\\_curriculum](https://github.com/3springs/deep_ml_curriculum)

## CORE SKILLS

### Agentic & Multi-Agent GenAI

Multi-Agent System Design & Deployment · LangGraph / AutoGen / DSPy · Orchestration & State Management · Tool-Calling / Function Calling · ReAct & Self-Reflection · RAG & Vector Databases (FAISS, Pinecone, Chroma) · Prompt Design & Engineering · LLM Fine-tuning & Evaluation · AWS Bedrock + Guardrails · Agent Evaluation & Safety

### AI Interpretability, Evaluation & Research

Model Interpretability & Explainability · Performance Estimation & Statistical Control · Model Evaluation Sets & Benchmarks · LLM & Agent Evaluation · Robustness & Failure-Mode Analysis · Adversarial ML (Attacks & Defences) · AI Safety & Red-Teaming · IEEE Publications & Conference Talks · Experimental Design

## DATA SCIENCE MANAGER

May 2024 - Oct 2025

Virtual Gaming Worlds (VGW) | Perth, Australia

Led a 13-person Data Science & Analytics team with direct P&L impact. Promoted to Head of Data Science within 18 months.

- Built and shipped fraud detection combining Agentic AI, LLMs, and Computer Vision on AWS, generating \$230M+ USD ROI in year one
- Personally architected core systems: model architecture, LLM orchestration layer, and CV pipeline - hands-on technical leadership, not pure management
- Developed KYC red-teaming frameworks against deepfakes, synthetic identities, and adversarial inputs, drawing directly on PhD-era adversarial ML research
- Automated AMOE and compliance workflows, significantly cutting processing times and reducing manual review burden
- Partnered with CTO to shape the AI/ML roadmap and guide strategic risk decisions at board level

## SENIOR DATA SCIENTIST

Nov 2022 - April 2024

Artrya, MedTech, AI for Coronary Artery Disease | Perth, Australia

Led ML model development and MLOps for clinical AI products. Two of the models developed received FDA 510(k) clearance for commercial use.

- FDA-Cleared Models: contributed to two AI models approved for FDA commercialisation (stenosis estimation and plaque classification) through rigorous clinical validation and regulatory submission work
- 3D CNN Cardiac Imaging: designed and trained attention mechanism architectures (PyTorch/Tensorflow) for coronary CT analysis, significantly outperformed previous baselines
- Data-Efficient Learning: active and semi-supervised learning to reduce dependency on costly clinical annotations while maintaining diagnostic accuracy
- Clinical MLOps: AWS SageMaker lifecycle management and MLflow for regulatory-grade experiment tracking, plus a Streamlit annotation platform supporting FDA/TGA submissions
- Supervised a Master's student (University of Twente) on GAN-based radiomic feature harmonisation across CT scanner vendors

## HEAD OF DATA AND SOFTWARE

May 2021 - Nov 2022

VitalTrace, MedTech Startup, Continuous Lactate Monitoring | Perth, Australia

Joined as Senior Data Scientist (Tech Lead) and promoted to Head of Data and Software within 9 months. Built the entire data, software, and ML capability from zero. Led 7 direct reports. Concurrent with part-time research at UWA (Feb-Nov 2022).

- Built company's first data platform from scratch: data lake, data warehouse, and all AWS pipelines (Airflow, Lambda, Aurora/PostgreSQL)
- \$65K saved in first 4 months by replacing external consulting and third-party software with in-house solutions
- ~80 hours/week saved via a cloud-native electrochemical analysis application, eliminating reliance on external vendors
- Biosensor ML: deep learning and statistical models for continuous lactate monitoring, accelerated R&D insights by 50% fortnightly

## Machine Learning & Languages

Python · PyTorch · TensorFlow · Scikit-learn · LightGBM · Algorithm Optimisation & Efficiency · Adversarial ML · Active/Semi-supervised Learning · SQL · R

## Enterprise Architecture & Transformation

Enterprise-Scale AI & Cloud Transformation · Cloud-Native Architecture (AWS) · Solution Architecture & Technical Design · Enterprise GenAI Adoption Patterns · Roadmaps & Capability Uplift · Technical Pre-Sales & Solution Shaping

## Software Engineering & Delivery

Platform Engineering / DevOps / CI/CD · Full SDLC & End-to-End AI Delivery · Code Standards & Maintainable Code · Docker / REST APIs / Microservices · Java / TypeScript / NodeJS

## Computer Vision

CNNs / 3D CNNs / VLMs · Object Detection / OCR · Segmentation / Medical Imaging

## MLOps & Cloud (AWS)

AWS Bedrock / SageMaker · S3 Tables / Apache Iceberg · Kafka MSK · MLflow · W&B · Airflow · Docker · Snowflake · Spark · Databricks

## Advisory & Stakeholders

Trusted Technical Advisor · C-suite & Board Communication · Cross-Functional & Client Delivery · Non-Technical Stakeholder Guidance · Thought Leadership & Conference Talks · Team Leadership & Mentoring

## CERTIFICATIONS

### AI Red Teamer Path

Hack The Box Academy · 2026

### Global Cyber Skills CTF

Operation Blackout · HTB · 2025

### Agentic AI (7 courses)

DeepLearning.AI · 2025

Eval & Govern AI Agents, DSPy, AutoGen, LangGraph, LangChain for LLM Apps

### RSNA Medical Imaging AI (Advanced + Foundational)

RSNA · 2023

### ML in Production

DeepLearning.AI · Jul 2022

### AI for Medical Diagnosis

DeepLearning.AI · Apr 2020

## LECTURER & RESEARCHER (AI/Computer Vision) Feb 2019 - Nov 2022

The University of Western Australia (UWA) | Perth, Australia

Dual role: Cloud Computing Lecturer (2019-2021) and DARPA-funded adversarial ML researcher. Concurrent industry engagements: Chevron ML contract (Jul 2020-Mar 2021) and VitalTrace from May 2021.

- DARPA Research: US DoD-funded program on adversarial machine learning, contributing novel attack and defence strategies for computer vision systems
- Chevron ML contract (Oil & Gas, Jul 2020 - Mar 2021): industry ML engagement; contributor to the first open-source DS/ML curriculum for the Oil & Gas industry
- Published in IEEE CVPR, WACV, and 3DV (top-tier venues in computer vision)
- Lectured Cloud Computing (AWS) units to undergraduate and postgraduate cohorts

## CO-FOUNDER & CHIEF DATA SCIENTIST

Oct 2017 - Jun 2019

SmartVision AI | Perth, Australia

Co-founded a Computer Vision and ML startup building real-time hazard detection for road infrastructure. Led all AI development and product direction.

- Designed and trained deep CNN architectures for real-time roadside hazard detection from video footage, in partnership with Mainroads Western Australia
- Won 1st place at the WA Ministry of Data Hackathon (40+ teams) and secured a \$21K SPURonWA government innovation grant within five months of founding
- Led AI development across the full stack: data collection, model training, deployment, and product integration

## SOFTWARE DEVELOPER & ML ENGINEER

Apr 2018 - Jun 2019

HIVO, Digital Asset Management SaaS | Perth, Australia

Built ML and computer vision features into a cloud-based Digital Asset Management platform serving enterprise clients across government, sport, media, and resources. Concurrent with SmartVision AI.

- Built facial recognition, advanced image search, and ML-powered asset analytics using PyTorch, Keras, AWS Rekognition, and SageMaker
- Developed a scalable asset management pipeline integrating image classification, tagging automation, and similarity search across large media libraries
- Directly contributed to winning three major enterprise accounts: Woodside Energy, Telethon Kids Institute, and Fremantle Dockers

## SOFTWARE ENGINEER

2014 - 2017

Globant, Enterprise consulting across three countries | Colombia, USA, Australia

Software consultant delivering production features for enterprise clients across Colombia, the United States, and Australia. Stack: JavaScript/TypeScript, ReactJS, NodeJS, PostgreSQL, Oracle, Docker, CI/CD.

- Southwest Airlines (via Globant): migrated a legacy airline platform to a microservices architecture using the Netflix OSS stack (Eureka, Zuul, Ribbon), deployed across Texas and San Francisco data centres
- National Geographic, Disney, ESPN, Royal Caribbean (via Globant): Java backend engineering on high-traffic consumer platforms serving millions of users globally
- Bank of Bogotá: built features for the Customer Indebtedness System including SOAP/REST API endpoints and Oracle/PostgreSQL stored procedures supporting millions of daily transactions

## VOLUNTEER

### Organizer, Perth ML Group

Perth Machine Learning Group · Feb 2019 - Present (6+ yrs)

Talks on AI/ML trends & innovation

### Content Creator & Alpha Tester

DeepLearning.AI · 2019-2020

### Advisor / Member / UniMentor

Data Science Club & UniMentor, UWA · 2019-2021

## BACKEND JAVA DEVELOPER

2011 - 2013

BinaryTools | Bogotá, Colombia

First professional engineering role. Built and maintained Univex, a secure information management system for sensitive government and defence clients.

- Developed backend features and PL/SQL procedures for Univex (univex.com.co), a mission-critical platform used by Colombia's Counterintelligence School, National Army, and Military University UMNG, in a high-compliance, security-sensitive environment (Java, Oracle, SOAP APIs)

## PUBLICATIONS: IEEE PEER-REVIEWED

IEEE CVPR & WACV are top computer vision venues globally (15-25% acceptance rates)

IEEE CVPR 2021 - Assistive Signals for Deep Neural Network Classifiers

IEEE 3DV 2022 - Attacking Image Classifiers To Generate 3D Textures

IEEE WACV 2022 - Transferable 3D Adversarial Textures using End-to-end Optimization

IEEE WACV 2021 - Defense-friendly Images in Adversarial Attacks

IEEE IJCNN 2021 - Adversarial Attacks and Defense using YCbCr Color Images

## HONOURS & AWARDS

Selected distinctions across AI leadership, research, cybersecurity competitions, and innovation grants.

### Exceptional Impact Award, VGW

Aug 2025

Recognised for contributions to revenue growth and shaping VGW's AI & Data strategy.

### Hack The Box: Operation Blackout - 2nd in Australia / 41st Globally (796 teams)

May 2025

HTB's Global Cyber Skills Benchmark CTF, focused on AI/ML security challenges. Solved Neural Detonator (most complex AI/ML challenge) by reverse-engineering a hidden payload in a Keras model. Proof of hands-on technical depth at leadership level.

### Global Talent Visa (Australian Citizen)

Sep 2022

Awarded permanent residency under Australia's Global Talent program for outstanding expertise in AI and Data Science.

### ACS 1962 Medal Finalist

Sep 2022

Top 5 PhD thesis in Western Australia.

### COVID-19 AI Detection Project

Jun 2020

Led AI project (X-ray/CT anomaly detection) funded by the Colombian Government (\$800K AUD). Featured in national media.

### Australian Government RTP Scholarship + UPA

Oct 2018

Competitive international PhD scholarship (100% fees) plus living stipend.

### 1st Place, WA Ministry of Data Hackathon (Aug 2018) and SPURonWA Innovation Grant (Nov 2017)

2017-2018

SmartVision AI: real-time roadside hazard detection (Mainroads WA), backed by a \$21K WA Government grant.