

FERRAN VIDAL-CODINA

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Data Scientist • AI & Machine Learning Engineer

PROFILE

MIT Ph.D. with 9 years of research and engineering experience, 7 of them shipping production data platforms, machine learning systems and production AI applications for FIFA, Google, the English Premier League, the Golden State Warriors, FC Internazionale, US Soccer and leading sports technology companies. Half of a two-person consultancy delivering 15+ commercial engagements, owning the data engineering, data science, machine learning and AI build across computer vision, retrieval-augmented LLM applications and large-scale cloud infrastructure. US permanent resident seeking fully remote roles; based in Hawai'i with full overlap with US Pacific business hours and late mornings through afternoon on US Eastern.

TECHNICAL SKILLS

Languages: Python, SQL, JavaScript

AI & ML: Claude Code, Codex, Gemini CLI, Retrieval-Augmented Generation, LangChain, agentic workflows, TensorFlow, PyTorch, computer vision, deep learning

Cloud & Data: GCP (BigQuery, Cloud Storage, Cloud Run, Dataflow), AWS (Redshift, Lambda, Glue, Step Functions), Apache Spark, DuckDB, Neo4j, MongoDB, Prefect, Airflow, RabbitMQ, gRPC

Engineering: Docker, Git, FastAPI, Claude Code, Next.js, React, TailwindCSS

PROFESSIONAL EXPERIENCE

TTY Analytics & Consulting

Lead AI & Data Scientist

Remote

Sept. 2022 – Present

Two-person data and AI consultancy. Work alongside the Managing Partner across 15+ commercial engagements for 10 clients, including Google, FIFA, the Golden State Warriors, FC Internazionale, the English Premier League and US Soccer; leading the data engineering, data science, machine learning and AI implementation end to end.

- o **LLM Applications.** Designed and built AI analytics assistants for basketball and football using Retrieval-Augmented Generation, LangChain, Prefect, OpenAI, BigQuery, DuckDB and Neo4j, including data ingestion pipelines from open-source endpoints, Python backend and evaluation workflows for natural-language querying over **20** seasons of play-by-play and **80** seasons of box-score data. For a VR football simulation game, engineered a conversational AI coach across 8 game scenarios to deliver consistent coaching feedback, and deployed cloned-voice text-to-speech to create a fully immersive experience.
- o **Computer Vision & Machine Learning.** Led a deep learning pipeline that automatically digitizes proprietary football playbooks for customized training: semantic segmentation of routes in 2D play diagrams followed by waypoint tracing into structured play objects. Trained a multi-GPU TensorFlow model **entirely on a synthetic dataset** built to overcome the absence of annotated playbooks, with adversarial augmentation to close the domain gap, and achieved **>80% IoU on real client playbooks with zero real training labels**. Also designed models for real-time NBA game archetype classification from play-by-play data using BigQuery ML.
- o **Data Platforms & Infrastructure.** Built and maintained the FC Internazionale data warehouse— **20** Lambda, Glue and Step Functions pipelines integrating tracking and eventing data from multiple providers and leagues into Redshift, and query-level cost attribution that cut Redshift spend by **50%**. Engineered a low-latency gRPC ingestion service on GCP streaming live soccer tracking and skeletal data at **10 MB/s** over the course of FIFA technology certification events with **50 ms** p99 end-to-end latency. Performed cloud and data architecture assessments for multiple professional sports organizations, advising on infrastructure modernization, ML adoption and scalable platform design, and in all cases these assessments resulted in follow-up engagements.
- o **Technical Leadership.** Led a cross-functional evaluation of multiple real-time skeletal tracking and player mesh data feeds for English Premier League matches, presenting findings to technical and executive stakeholders.

MIT Sports Lab (FIFA-sponsored)

Research Scientist

Cambridge, MA

July 2019 – June 2023

Led applied data science and machine learning research for FIFA, delivering production analytics for elite soccer competitions. Held concurrently with the TTY role from Sept. 2022 in order to see the FIFA World Cup auto-eventing programme through to delivery.

- o Developed a novel algorithm for automatic event detection in soccer from player and ball tracking data, achieving **>90% event detection** and **>95% set-piece detection** across more than **450 professional matches**. Deployed for post-match auto-eventing at the **2022 FIFA World Cup**.

- o Led technical validation of the optical skeletal tracking and connected-ball systems behind FIFA's Semi-Automated Offside Technology ([announcement](#)), evaluating latency, synchronization and overall data quality across **80+** matches and testing sessions and communicating findings to technical stakeholders.
- o Built cloud-native infrastructure on GCP and RabbitMQ to collect and analyze the latency of tracking data from multiple sensing technologies in real-time.
- o Published award-winning research on automatic event detection (**ISEA Paper of the Year**). Collaborated with FIFA, the English Premier League, FC Barcelona and the German Football Association (DFB) and several technology providers, including Kinexon, Tracab, Hawkeye and Skillcorner.

RESEARCH EXPERIENCE

MIT — Aerospace Computational Design Lab & MIT Sports Lab

Cambridge, MA

Postdoctoral Associate

June 2017 – June 2019

Continued Ph.D. research in computational electromagnetics while transitioning into sports data science.

- o Developed a nested hybridizable discontinuous Galerkin method that reduced memory footprint and delivered **100× reductions in computational cost** for large-scale plasmonic simulations, plus the first numerical method for simulating second-harmonic generation in 3D plasmonic nanostructures.
- o Performed simulations for periodic coaxial nanogap structures and demonstrated that nonlocality is responsible for the large resonance blue-shifts observed on sub-5 nm gaps instead of surface roughness by comparing to experimental results.
- o Led a three-student team on a **San Antonio Spurs**-sponsored project (MIT class 2.980): built models to infer 3D athlete external load from 2D video tracking data and calibrated against accelerometer ground truth, which became the entry point into a full career move to sports data and machine learning.

PROJECTS

AI Meal Planning Platform

2025

Personal project

- o Built and shipped a full-stack AI product to production solo: Next.js, React, MongoDB, TailwindCSS, Auth.js, Stripe and Resend, with OpenAI and DeepSeek powering recipe generation, meal planning and nutritional analysis.
- o Covered the entire path from concept to deployed application — authentication, payments, transactional email and LLM workflow design — as a sandbox for AI-native product engineering.

Conversational CV Chatbot

2025

Personal project

- o Retrieval-augmented [chatbot](#) that answers questions about my background, deployed on Hugging Face Spaces.

EDUCATION

MIT

Cambridge, MA

Ph.D. in Computational Science & Engineering, minor in Machine Learning

2013–2017

- o Thesis: *Simulation Methods for Plasmonics* — high-order numerical methods for large-scale electromagnetic wave simulation at the nanoscale.

MIT

Cambridge, MA

S.M. in Computation for Design and Optimization

2011–2013

Polytechnic University of Catalonia (UPC)

Barcelona, Spain

Dual B.Sc. in Civil Engineering & B.Sc. in Mathematics

2005–2011

HONORS & AWARDS

- o **MIT Alumni News Cover**. Data validation work for FIFA ([article](#)). 2026.
- o **Paper of the Year Award**, International Sports Engineering Association & Springer, for *Automatic Event Detection in Football Using Tracking Data* ([paper](#)). 2023
- o **La Caixa Foundation Fellowship** for graduate studies at MIT (\$150,000; 7.5% acceptance rate). 2011
- o **CFIS fellow** to pursue 2 major STEM degrees simultaneously. 40 admitted students/year in Spain. 2008

LANGUAGES

Catalan (native) • Spanish (native) • English (fluent)