Alejandro Rodriguez

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Summary

AI Research Scientist / Data Scientist / AI Engineer with 1 YoE in marketing science, 2 YoE in finance and sports analytics and 2 YoE in ML research. M.S. in Computer Science and B.S. in Mathematics & Computer Science from top-20 US universities. Proficient in Python and its ML ecosystem, with a strong mathematical background. Experienced in designing and developing ML, GenAI and Agentic AI models and systems. Proven ability to come up with new ideas and improve upon existing solutions. Eager to work with engineering, product and business teams to drive innovation, AI/data products and business growth.

Work & Research Experience

NIQ (Nielsen IQ) **Aug 2025 - Present**
Data Scientist - Incubation Lab *Madrid, Spain*

- Researching new methodologies to apply to NIQ's product offerings in marketing science and developing new internal tools for NIQ consultants and Data Scientists.
- Performing personalized case studies for clients -Google, Meta, The Coca-Cola Company, Reckitt- that require tools and methodologies not offered by NIQ's core product.

University of California San Diego - Physics Department **Jun 2025 - Present**
Research Scientist (part time) *Remote (Madrid, Spain)*

- Assisting Prof. Broekgaarden in applying ML models and methodologies to gravitational wave paleontology projects.
- Also providing software development support for tools and projects, such as STROOPWAFEL 2.0: testing and documenting a simulation system for identifying rare outcomes from astrophysical populations related to gravitational wave sources.

Dioscuri Capital **Jun 2023 - Jan 2025**
Machine Learning Engineer *Remote (San Diego, California, USA)*

- Prototyped a multi-modal Retrieval-Augmented Generation (RAG) system (built on LlamaIndex & GPT-4o) to support quant researchers in financial analysis tasks. Tested alternative LLMs, chunking strategies and embeddings.
- Collaborated with portfolio managers and quant researchers to design and implement an AI-powered quantitative investment strategy and algorithmic portfolio management and trading system for a multi-million dollar fund.
- Developed a few-shot semi-supervised machine learning model using Python, PyTorch and Python ML libraries, to detect volatility contraction patterns in time series of trading data, achieving a 40% improvement in pattern recognition capabilities.

University of Massachusetts Amherst **Sep 2023 - Dec 2023**
Teaching Assistant, Manning College of Information and Computer Science *Amherst, Massachusetts, USA*

- Assisted Prof. Rattigan in a "Data Analytics with Python" class of 50 students. Held office hours and graded assignments.

Cleat Street **Jun 2022 - Jan 2023**
Data Scientist Intern, Analytics Team *San Diego, California, USA*

- Engineered a fully-automated end-to-end analytics workflow for efficiently predicting NBA player performance, utilizing Python and Apache Spark ecosystem for processing 5 million data points per season.
- Contributed to development and evaluation of custom deep learning models for predictive analytics, achieving milestone goals in data modeling and results visualization.
- Significantly improved trading platform performance, achieving a 3.0x increase in year-over-year trading volume and a 1.7x increase in ROI with 30% reduction in volatility, evidencing the solid foundation laid for the NBA bet pricing platform.

University of California San Diego - Computer Science & Engineering Department **Sep 2020 - Jun 2022**
Undergraduate Researcher. Advised by Prof. Rose Yu. Research area: Machine Learning *La Jolla, California, USA*

- Led research on Spatio-Temporal Multi-Resolution Tensor Learning (ST-MRTL) models, and applied it to sports analytics, which enhanced understanding of performance dynamics of basketball players.
- Implemented an innovative ST-MRTL model that generates evolving and playstyle-specific shooting profiles of NBA players.
- Presented findings at the prestigious MIT Sloan Sports Analytics Conference.

Education

University of Massachusetts Amherst **Sep 2022 - Dec 2023**
M.S. Computer Science (Data Science Specialization) *Amherst, Massachusetts, USA*
Completed 7 PhD-level courses on Machine Learning, Deep Learning, Artificial Intelligence and Statistical Modeling.

University of California San Diego **Aug 2019 - Jun 2022**
B.S. Mathematics - Computer Science *La Jolla, California, USA*
Provost Honors in 2021, 2020, 2019. Graduated in just 3 years.

Skills

Mathematics: Linear Algebra, Vector Calculus, Statistical Modeling, Numerical Optimization, Time Series Analysis.

Programming Languages: *Proficient* > Python, C, C++, MATLAB. *Experience* > R, C#, Java, JavaScript.

ML, Agentic AI, Data Science: *Proficient* > Claude Code, PyTorch, scikit-learn, NumPy, Pandas, matplotlib, SQL, TensorFlow, Keras, LlamaIndex. *Experience* > fast.ai, LangChain, Hugging Face Transformers, Vector DBs, Apache Spark, Plotly.

MLOps & Infrastructure: *Proficient* > JupyterLab, MLflow, Git & GitHub, Linux, Docker. *Experience* > Vertex AI, SageMaker, Azure ML, Azure AI, TensorFlow Extended (TFX), Google GCP, Amazon AWS, Microsoft Azure, Kubernetes.

Science Challenges & Competitions

NSF HDR A3D3: Detecting Anomalous Gravitational Wave Signals **Dec 2024 - Feb 2025**

- National Science Foundation (NSF) challenge that integrates astrophysics with machine learning, encouraging innovative approaches to the detection and identification of anomalous gravitational-wave signals from unknown sources.
- Developed an ensemble ML model, trained on data from the Laser Interferometer Gravitational-wave Observatory (LIGO) project. Base models include a transformer-based encoder-decoder network pre-trained on an autoencoder that reconstructs the data, and two convolutional networks trained on covariance and singular-spectrum analysis (SSA) of the data.
- The model achieved 98% accuracy, 96% TPR (True Positive Rate) and 99% TNR (True Negative Rate) on a test set.

AGATE: High School District Program in California for Gifted & Talented Students **Sep 2017 - May 2018**

- Developed a deep learning generative language model for automatic generation of English poetry in the style of any given poet (a.k.a. author linguistic style transfer).
- Conducted validation tests that demonstrated subjects could not distinguish between original and generated works with 95% confidence, using statistical analysis tools.
- Won four mathematics and computer science awards at CSEF and at an ISEF-qualifying event.

Certifications & Online Courses

Reinforcement Fine-Tuning LLMs with GRPO. Deeplearning.ai. June 2025.

Building RAG Agents with LLMs. NVIDIA Deep Learning Institute. Sep 2024.

Introduction to On-Device AI. Deeplearning.ai (in collaboration with Qualcomm). May 2024.

Natural Language Processing with Attention Models. Deeplearning.ai. Oct 2023.

Machine Learning Engineering for Production (MLOps) Specialization. Deeplearning.ai. Aug 2023.

Deep Learning Specialization. Deeplearning.ai. Dec 2018.

Publications

Alejandro Rodriguez Pascual, Ishan Mehta, Muhammad Khan, Frank A. Rodriz, Rose Yu, "Understanding why shooters shoot – An AI-powered engine for basketball performance profiling". 2022 MIT Sloan Sports Analytics Conference. Boston, MA. Mar 4-5, 2022. arXiv:2303.09715 [cs.LG]

Alejandro Rodriguez Pascual, "BACON - Deep-Learning Powered AI for Poetry Generation with Author Linguistic Style Transfer". 2018 CSEF. Los Angeles, CA. Apr 23-24, 2018. arXiv:2112.11483 [cs.CL]

Honors & Awards

UC San Diego SMASH Hackathon. Best Performing Model award in the NSF HDR GW challenge. Feb 2025.

Eta Kappa Nu (HKN, IEEE International Honor Society) Inductee. Jan 2021.

University of California San Diego Computer Science & Engineering Early Research Scholar. Sep 2020.

National AP Scholar with Distinction. Jun 2019.

National Hispanic Recognition Program (NHRP) Scholar. Aug 2018.

California Science & Engineering Fair (CSEF). Apr 2018. Finalist & Honorable Mention in Mathematics. 1st Place Award in Computer Science at a qualifying ISEF (International Science and Engineering Fair) event.

Volunteer Service & Leadership Experience

Eta Kappa Nu, University of California San Diego Chapter. *Math - Computer Science Department Chair.* Sep 2021 - Jun 2022.
Mentored 4 new inductees, organized events and served as a liaison between faculty and students.

Triton Software Engineering (UCSD). San Diego, CA. *Software Developer.* Oct 2019 - Jun 2022.
Developed software applications for 3 NPOs that serve disadvantaged communities and minorities.

St. Anthony's Foundation. San Francisco, CA. *Tenderloin Technology Lab Associate.* Oct 2018 - Jun 2019.
Educated 20+ residents of the Tenderloin district on technology skills for work and daily tasks.