

Tomas Coghlan

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EDUCATION

Stanford University | *B.S. Mathematical and Computational Science*
M.S. Computer Science (Concentration in AI)

Sep. 21 - Jun. 26

WORK EXPERIENCES AND ORGANIZATIONS

SolidCore AI | *Software Engineering Intern*

June. 25 - Sep. 25

- Led development of a relational backend data model enabling key product features at a 10-person seed-stage startup.
- Integrated machine learning components to detect personally identifiable information (PII) in LLM prompts and outputs.
- Contributed full-stack code across flagship projects using Python, PostgreSQL, FastAPI, Tailwind CSS, Temporal Workflows, React, Next.js, and AWS.

Cabrillo Coastal Insurance | *Business Intelligence + Product Innovation Intern*

Jun. 24 - Aug. 24

- Trained machine learning models to improve prediction of ultimate hurricane losses, enhancing forecasting accuracy by tens of millions of dollars
- Applied Markov chain queue theory to analyze call center demand patterns and recommend optimal staffing levels, thereby improving service efficiency and reducing bottlenecks.
- Performed business intelligence analyses and ad hoc data reporting using SQL, Workbench IDE, Prodiver, and Diveport to support decisions by non-technical stakeholders.

Stanford Medicine | *Research Intern*

Jun. 23 - Sep. 23

- Served as first author on a research paper analyzing social media bot activity linked to major tobacco corporations. Found probable bot accounts made up 34% of the accounts that engaged with PMI's Facebook page in 2023.

PROJECTS

Oxford Machine Learning Tutorial | *Brasenose College*

Jan. 24 - Mar. 24

Engaged in one-on-one instruction and weekly applied projects covering a range of machine learning methods and applications:

- Unsupervised learning to generate songs' music genres (clustering and dimensionality reduction).
- Neural networks and training strategies (hyperparameter optimization, variance/bias tradeoff)
- Predicting house prices (linear regression, lasso, ridge, elastic net)
- Credit card approval models (logistic regression, decision trees, bagging, random forests, boosting)

LLM Training Improvements | *Final Project: Deep Reinforcement Learning*

Apr. 25 - Jun. 25

- Developed and tested a loss-based curriculum learning approach for DPO and SFT fine-tuning of LLMs, achieving 20% faster convergence during training without performance loss.

NBA Broadcast Player Tracking | *Final Project: Deep Learning for Computer Vision*

Apr. 25 - Jun. 25

- Mapped player positions through fine-tuned YOLO models and homography to transform broadcast camera footage into real-world court coordinates.

Housing Selection Algorithms | *Final Project: Incentives in Computer Science*

Apr. 24 - Jun. 24

- Modeled Stanford University's housing selection system and implemented different selection algorithms to improve fairness with disability housing allocation on campus.

NLP Stock Price Prediction | *Final Project: NLP with Deep Learning*

Jan. 25 - Mar. 25

- Fine-tuned a modified GPT-2 architecture on historical tweet data to predict short-term stock price movements, focusing on Elon Musk's posts and their correlation with Tesla's intraday performance.

SKILLS

Programming Languages/Packages: Python, Pytorch, Scikit-learn, R, C++, SQL

Human Languages: English, Italian (B2), Spanish (B1)