Career Direction & Vision

Career Vision Overview

- Building a career that connects **analytical rigour** with **meaningful impact**.
- Interests span:
  - Actuarial & Advanced Statistics
  - NLP, ML & AI Applications
  - Marketing Analytics & Consumer Insights
  - Insurance & Financial Risk Modelling
  - Python, Data Engineering & MLOps

Actuarial & Advanced Statistics

Goal: Build strong foundations for actuarial exams and applied statistical modelling.

- Actuarial Mathematics: Reserving, Pricing, Survival Analysis
- Actuarial Statistics: Probability, Inference, GLMs, GAMs
- Advanced Time Series: ARIMA, ETS, GARCH, Prophet
- Bayesian Methods: Priors, MCMC, Probabilistic Programming
- Hypothesis Testing, Regression, Driver Analysis in actuarial data

NLP, ML & AI Applications

Goal: Demonstrate breadth and depth across core NLP tasks and MLOps workflows.

- Sentiment Analysis, Classification, Entity Recognition, Summarisation, RAG
- Evaluation Metrics: F1, Precision/Recall, ROUGE, BLEU, MRR
- Libraries: spaCy, NLTK, Hugging Face, LangChain
- Preprocessing and Data Ethics
- Prototyping and Deploying NLP Applications with CI/CD
- Monitoring Model Drift and Retraining

Marketing Analytics & Consumer Insights

Goal: Apply data science in real-world business contexts.

- Marketing Mix Modelling and Attribution Frameworks
- Campaign Optimisation, Personalisation, Profiling
- Experiment Design: A/B Testing, Uplift Modelling
- Forecasting for Sales, Promotions and Media Effectiveness
- Responsible AI in Marketing: Bias, Fairness and Ethics

Insurance & Financial Risk Modelling

Goal: Combine actuarial science with modern machine learning.

- Claims Frequency and Severity Modelling (GLMs, GBMs, Deep Learning)
- Loss Development Triangles: Chain Ladder, Bornhuetter-Ferguson, Mack Model
- Fraud Detection: Graph ML, Anomaly Detection
- Pricing Algorithms: Base Rates, Factor Selection, ML Uplift
- Reserving and Capital Modelling: Time Series, Bayesian Structural Models
- Short, Medium and Long-term Disruption: Explainable AI, Causal ML, Generative AI

Python, Data Engineering & MLOps Foundations

Goal: Demonstrate ability to take models from notebook to production.

- Core Python and Object-Oriented Programming
- Data Wrangling: pandas, NumPy, SQL
- APIs, Web Scraping, Automation
- Machine Learning Frameworks: scikit-learn, PyTorch, TensorFlow, XGBoost
- Model Interpretability: SHAP, LIME
- Docker, CI/CD, GitHub Actions, Cloud Deployment
- Monitoring, Drift Detection, Retraining Workflows

Vision Summary

- Build deep technical foundations while demonstrating practical applications.
- Develop expertise across multiple domains: Actuarial, ML/AI, Marketing Analytics, Financial Risk, and MLOps.
- Emphasise continuous learning, experimentation, and reflective practice.
- Apply analytical rigour to drive meaningful impact.