Quincy Sproul

quincy.sproul@gmail.com ❖ 07503589653 ❖ Leamington Spa ❖ Portfolio / Github

EDUCATION

University Of Bristol **July 2024**

MEng, Engineering Mathematics (Final Grade 2:1)

- Relevant Modules:
  - EENG20004 C for Embedded Systems (72%), EENG21000 Signals and Systems (71%), EMAT20012 Applied Linear Algebra (72%), EMAT20540 Discrete Mathematics 2 (82%), EMAT30008 Scientific Computing (82%), EMAT30670 Optimisation Theory and Applications (70%), EMATM0029 Bio-Inspired Artificial Intelligence (70%), EMATM0053 Robotics Systems UG (78%)

PROJECTS

- Project 1: Multi-view Hand-Tracking and Gesture Detection for VR (Final Year Project)
  - Developed a system for early classification of dynamic hand gestures in VR environments. Discretised features from 3D hand landmark coordinates, varied size of sequences and various data processing methods (anomaly removal, smoothing techniques), trained Transformer models to predict future hand states. Used lookup tables & DTW to classify gesture sequences. Explored the balance between prediction accuracy & latency reduction.
- Project 2: Visual Search Model with Deep Embeddings & Contrastive Learning
  - Combined transfer learning (ResNet-34 as a backbone network) with a custom contrastive learning loss, feature extraction refinement to optimise the model.
- Project 3: Line-Following Algorithm for Pololu 3pi+ 32U4 Robot (Grade: 100%)
  - Developed a line-following algorithm for the Pololu 3pi+ 32U4 robot. Implemented sensor-based detection, PID control for navigation, and embedded systems programming. Optimised performance for various line patterns through sensor calibration and motion control refinement.
- Project 4: Scientific Computing Toolbox for Solving ODEs & PDEs
  - Software toolbox for solving Ordinary & Partial Differential Equations. Implemented numerical methods & adaptive step-size algorithms for improved accuracy. Designed a user-friendly interface for inputting equations & parameters. Received a "gold-plated" submission.
- Project 5: Simulating Crowd Behaviour with Agent-based Modelling
  - Adapted Craig Reynolds' 'Boids' algorithm for crowd behavior & implemented novel line-of-vision logic. Explored impact of stage shapes, crowd density and stationary/moving performer on visibility.
- Project 6: Benchmarking Productivity of Github Projects with Stochastic Modelling.
  - Analysed GitHub commit logs to predict developer productivity. Used data scraping, cleaning, and stochastic modeling to understand developer behavior and performance.

CERTIFICATIONS, SKILLS, EXPERIENCE & INTERESTS

- **Certifications:**
  - **Dataquest.io:** Data Analyst in Python, Data Scientist in Python | **Coursera:** Neural Networks and Deep Learning, Improving Deep Neural Networks, Convolutional Neural Networks | **Qubit by Qubit (IBM):** Intro to Quantum Computing
- **Skills:**
  - **Machine Learning & AI:** Transformers, Computer Vision, NLP, TensorFlow, Keras, PyTorch, Scikit | **Data Science:** Analysis, Visualization, Feature Engineering, Time Series Analysis, Pandas, NumPy, Matplotlib, Seaborn | **Languages:** Python, Git, C++| **Mathematics:** Mathematical Modeling, Numerical Analysis, Algorithm Development | **Soft Skills:** Project Leadership, Problem Solving, Critical Thinking, Communication, Teamwork
- **Entrepreneurial Experience:**
  - Base Events (2019): Planned and executed a music event, generating approximately £5,000 in revenue. Developed skills in event management, marketing, financial planning, interpersonal skills, networking.
- **Interests:** Fitness & Sport; Music Production; Dog Walking; Entrepreneurship; Futurism; Philosophy; Comedy.