

EDUCATION

Vanderbilt University (Nashville TN, US)

PhD in Electrical and Computer Engineering

2019 – 2024 (Feb)

Durham University (Durham, United Kingdom)

Master and Bachelor of Physics (MPhys) with honours

2011 – 2015

ENGINEERING EXPERIENCE

Stealth Startup (remote)

Research Scientist Consultant (part time)

2024 – present

- Building a generative AI-powered chatbot using RAG and fine-tuning open source LLMs (Python, HuggingFace) to enhance companies' competitive edge.

Vanderbilt University (Nashville, TN)

Research Associate

2019 – present

Investigating the application of AI, machine learning, and statistics to democratize healthcare, by improving performance of sensors for medical diagnostic testing.

- Devised deep learning-based approach to reduce sensor response time by > 5x, using ensembles of LSTM neural networks (Python, TensorFlow) for time series forecasting, uncertainty estimation, and transfer learning with a large-scale simulated dataset, enabling rapid testing of harmful molecules.
- Designed a new biosensing paradigm by applying data visualization, classification and pattern recognition algorithms (Python, SciKit-Learn) to sensor array data, a step towards unprecedented robust, scalable, and low-cost biosensors.
- Invented algorithm using Morlet wavelet filtering and Fourier analysis (Matlab) which improved detection limits of thin film sensors by 10x, and released user-centric open-source app.
- Built software (Python) and hardware to automate data collection, improving accuracy by 48% and increasing experimental throughput by 100x, enabling larger datasets for more generalizable models.

Crowcon Detection Instruments Ltd. (Abingdon, UK) – \$47mil revenue company designing and manufacturing gas detection solutions for a wide range of industries.

Electronic Engineer

2015 – 2019

- Developed production-ready firmware (C) and hardware, collaborating with global cross-functional teams, driving the companies push towards IoT and expansion into a previously untapped market.
- Solved design flaws in products by troubleshooting customer issues under pressure and finding the root cause (temperature drift, static electricity), rescuing orders (\$70,000+).
- Designed new test procedures, using software (Python) and hardware to raise production yields by 5%.

LEADERSHIP

Vanderbilt University (Nashville, TN)

Research Mentor

2019 – 2024

- Led interdisciplinary team of junior and senior researchers working on projects I curated. The 10 mentees over 4 years went on to be co-authors on publications, presenters at national conferences, and graduate students embarking on PhD degrees of their own.
- Represented Vanderbilt School of Engineering to external stakeholders in public online information sessions and several in-person events, sharing research and experiences at Vanderbilt.

Teaching Associate

2019 – 2020

- Instructed undergraduate course focused on Python and digital systems, creating 30% of lab content.

AWARDS AND HONORS

- C.F. Chen 2022 Graduate Student Paper Award for “Best Paper in Electrical Engineering” (\$5000)
- SPIE Optics and Photonics Education Scholarship 2022 (\$3000)
- Vanderbilt Graduate Leadership Institute Fall 2022 Dissertation Enhancement Grant (\$2000)

SKILLS AND TOOLS

Python (LangChain, HuggingFace, PyTorch, NumPy, SciPy, Pandas, Scikit-learn, Keras, TensorFlow, Matplotlib), MySQL, Git, C, Linux, SPSS, SAS, Dimensionality reduction (LDA, PCA), Regression/Classification (Linear/Logistic Regression, Decision Trees, SVM, KNN, ANN), Time series forecasting (RNN, GRU, LSTM), Signal Processing (Fourier Analysis)