# SIMON WARD Ph.D.

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Simon Ward Vanderbilt

## ENGINEERING EXPERIENCE

**Tranquility AI** (remote) pre-seed start up delivering generative AI powered investigative tools for law enforcement and intelligence agencies.

***Director of AI*** **2025 – Present**

- Designed and implemented agentic architecture, improving answer quality and completeness, and cutting negative user feedback 50%.
- Fine tuned large multimodal models with abliteration, QLoRA, and DPO, to improve user question compliance by 70% without significantly compromising accuracy.

***Principal Machine Learning Engineer*** **2025**

- Trained and deployed lightweight classifiers for prompt routing, reducing unanswered queries by 99%.
- Identified and evaluated alternative vector embedding approach (binary vs. float), cutting dominant operational costs by 4x.

***Machine Learning Engineer*** **2024 – 2025**

- Built benchmarking suite (Python) that guided model and retrieval strategy, increasing factual recall by 15%.

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**Stealth Startup** (remote)

***Research Scientist Consultant*** *(part time)* **2024**

- Built and deployed a generative AI-powered chatbot using RAG and fine-tuning open source LLMs (Python, PyTorch, AWS) with sales data, to enhance companies' competitive edge.

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**Vanderbilt University** (Nashville, TN)

***Research Associate*** **2019 – 2024**

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

- Invented deep learning-based approach to reduce point-of-care test wait time by >5x with LSTM networks (Python, Tensorflow) for rapid testing of disease and toxins in food and the environment.
- Developed new paradigm for harmful molecule sensing, applying dimensionality reduction and classification (SciKit-Learn) to biosensor array data, enabling unprecedented robust and low-cost medical diagnostic testing.
- Led team of 10 interdisciplinary junior and senior researchers who became co-authors and presenters at national conferences.

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

***Embedded Systems Engineer*** **2015 – 2019**

- Designed embedded firmware/hardware (C) and resolved critical customer issues, driving expansion into untapped IoT market and saving $100k+ in high-stakes orders.

## EDUCATION

**Vanderbilt University** (Nashville TN, US)

**PhD in Electrical and Computer Engineering** **2019 – 2024**

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**Durham University** (Durham, United Kingdom)

**Master and Bachelor of Physics (MPhys) with honours** **2011 – 2015**

## AWARDS AND HONORS

- C.F. Chen 2022 Graduate Student Paper Award for "Best Paper in Electrical Engineering"
- SPIE Optics and Photonics Education Scholarship 2022
- Vanderbilt Graduate Student Council 2024 Leadership Award for Mentorship Excellence

## SKILLS AND TOOLS

Python (SciKit-Learn, PyTorch, Tensorflow, DSPy CrewAI), HuggingFace, Git/GitHub/Gitlab, AWS (Bedrock, SageMaker, CloudWatch, ECS, etc.), Docker, C, SQL, RAG (Pinecone, OpenSearch, FAISS, BM25), Named Entity Recognition, Text Classification, Model Training and Fine Tuning.