DR MATTHEW BEECHEY

Location: Loughborough, UK
Telephone: 07402238410
Email: mattbeechey@gmail.com

PROFESSIONAL PROFILE

Collaborative, driven, and multidisciplinary machine learning engineer, researcher, and product manager. Graduated with a PhD from Loughborough University in 2023, after publishing two high-impact journal articles. Research focused on utilising machine learning evidential classification (neural networks) in the network security domain. Recently completed a two-year contracted Technical Product Manager role in a commercial Internet of Things embedded engineering project. Other previous machine learning experience in time-series forecasting, graph neural networks, reinforcement learning, and computer vision.

KEY SKILLS

Key skills mainly focus around two specialisms: machine learning with Python, and embedded hardware and firmware design. Additional skills included in product management and various applications.

Programming: Python (including Django/Fast API), C, PHP, Java, SQL
Machine Learning/Data: Pytorch, Scikit-Learn, Pandas, Numpy, Scipy
Cloud computing: AWS S3, AWS EC2, AWS SageMaker
Applications/Services: KiCad, Altium Designer, Fusion 360, Grafana, Docker, Redis
Embedded: STM32 ARM Cortex-M, UART, ADC, I2C, MQTT, SPI, Ethernet, cellular, GNSS
Product management: Stakeholder engagement, web marketing, pricing, horizon scanning

WORK EXPERIENCE

Loughborough University June 2024 – Present
Position: Machine Learning Researcher
TITAN Consortium (EPSRC)

Responsibilities in this role involve creating novel machine learning techniques for networking slicing in the Beyond 5G domain. Used Graph Neural Networks to estimate end-to-end communications network latency. Presented work in a TITAN consortium conference and submitted research to the International Conference in Communications (ICC) 2025.

Vectare Ltd April 2022 – April 2024
Position: Technical Product Owner
Bus MONITOR: Monitoring Operationally Needed Information Through Onboard Resources

Responsibilities in this role involve leading a project to develop an embedded IoT sensor suite product which measures service quality and comfort on public transport vehicles to enhance passenger satisfaction. Soft skills involved in the project are stakeholder engagement and creating marketing material (blogs, video interviews). Technical skills involved are product ideation, schematic capture, PCB hardware design, bare-metal C programming, time-series database design, and time-series forecasting.

Loughborough University 2018
Position: Research Assistant
Frµit Testbed: The Federated Raspberry Pi Micro-Infrastructure Testbed

Responsibilities in this project were to benchmark networking performance on computing micro-clusters of embedded devices running server-loads, such as web hosting, file hosting, and data caching. Research aimed to determine whether low-power clusters might be deployable in rural areas instead of high-power servers. Results from these experiments were formalised to be published in conference papers later in the project lifecycle.

EDUCATION

PhD: Loughborough University, "Evidence Theory Based Machine Learning Approaches for Network Security" 2019 – 2023

The work and research undertaken in this role focused on machine learning in the network security domain. With a primary focus on evidential classification, the research was peer reviewed and published in two high-impact journals. Research focused on leveraging insight offered by Evidence Theory into the epistemic uncertainty in dataset features to perform feature selection. Other research focused on providing a level of AI security when networking data is perturbed by iterative Adversarial Machine Learning attacks.

MSc: Loughborough University, "Internet Computing and Network Security" 2017 – 2018
Grade: Distinction

The dissertation for this MSc degree was focused around leveraging blockchain technology to secure the Domain Name System from poisoning attacks. The blockchain was manually implemented, allowing for a deep understanding of smart contracts, transactions, and block hashing.

BSc: De Montfort University, "Computer Science" 2013 – 2016
Grade: First Class Honours

Modules included in this degree included networking, object-oriented design, secure web application development, data structures and algorithms, functional programming, and computer ethics.

PUBLICATIONS

M. Beechey, K. Kyriakopoulos and S. Lambotharan, "Evidential Classification and Feature Selection for Cyber-Threat Hunting", in Knowledge-Based Systems, vol. 226, pp. 107-120, 2021.

M. Beechey, S. Lambotharan and K. Kyriakopoulos, "Evidential Classification for Defending Against Adversarial Attacks on Network Traffic", in Information Fusion, vol. 92, pp. 115-126, 2023.

M. Beechey, M. Enoch, K. Kyriakopoulos, H. He, M. Ghulman, B. de Perthuis, A. Nathanail, "Bus MONITOR: Monitoring Operationally Needed Information Through Onboard Resources", in Computer-Aided Civil and Infrastructure Engineering, to be submitted in 2024.

PROFESSIONAL TRAINING

Business Future Leadership Training June - September 2022
KTP Residential Training, Ashorne Hill

This two-module residential training covered topics within management and communication, such as effective project management, leadership, how to inspire, personal effectiveness, resilience, and coaching others. Other topics include management styles, strategic thinking, gaining competitive advantages, pricing strategies, as well as accounts and cash-flow management.

ITOL KTP Innovation Strategy May – September 2023
Online hybrid

This course covered how to personally drive innovation, how to encourage innovation successfully in an industrial/commercial environment, identifying key stakeholders, how to sell an innovation idea to colleagues, and the common reasons for innovation to fail.

REFERENCES

Professor Marcus Enoch
Loughborough University
Telephone: 01509 223408
Email: m.p.enoch@lboro.ac.uk

Dr Konstantinos Kyriakopoulos
Loughborough University
Telephone: 01509 227542
Email: k.kyriakopoulos@lboro.ac.uk

Dr Mahsa Derakhshani
Loughborough University
Telephone: 01509 227193
Email: m.derakhshani@lboro.ac.uk

Alex Nathanail
Technology Director, Vectare Ltd
Email: alex@vectare.co.uk

Benoit de Perthuis
Lead Developer, Vectare Ltd
Email: benoit.deperthuis@vectare.co.uk

Dr Haitao He
Loughborough University
Telephone: 01509 223409
Email: h.he@lboro.ac.uk