

# Curriculum Vitae

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Established senior software developer with over a decade of experience architecting scalable systems and leading technical initiatives. Proven track record of mentoring teams, delivering enterprise 5G solutions, and driving technical strategy across complex distributed systems. Seeking Senior or Principal Engineer opportunities to leverage deep technical expertise and leadership experience.

## EXPERIENCE

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### Senior Software Developer

July 2021 – present

*Weaver Labs, London*

- Telecoms sector - B2B private 5G Network as a Service provider in commercial and research sectors
- Designed architecture for a distributed monitoring system for 5G networks using WireMQ, Prometheus, InfluxDB, Grafana, Docker, K8s - Used in two private 5G installations
- Mentored several PhD and Masters students in coding best practices, design-patterns, repository management, security, and testing
- Designed architecture for and led development of a full stack solution for fan engagement at a football stadium to promote the use of a private 5G network, including mobile app development
- Contributed to architecture and UX for upgrade from proof of concept to production of the stadium's private 5G network
- Undertook role as a cybersecurity specialist for project REASON+ during open sourcing of the project, implemented security policy, CI/CD jobs for automating tests and code compliance checks
- Primarily working in Python, but also Javascript frameworks including NodeJS and NextJS
- Working using AGILE framework, using an incorporated CI/CD approach to repository management
- Development of an asynchronous socket communication Python library - WireMQ

### Research Associate

January 2019 – July 2021

*Cardiff University, Cardiff*

- Improved collaboration of research group by implementing shared codebases on GitLab
- Improved modularity and maintainability of codebase by splitting large components into RESTful microservices deployed using Docker Swarm
- Reduced maintenance workload of microservices by automating TLS certificate generation and automating API documentation generation
- Automation in compliance for building information modelling standards
- Liaising with industrial partners and managing expectations
- Designing and implementing systems for automatic compliance checking using ontology
- Stakeholder engagement and dissemination of research through conference presentations and publications

### Software engineer

January 2016 – January 2019

*LUSAS, London*

- Delivered soil structural modelling algorithms (Duncan-Chang, Hardening Soil), enabling company expansion into the geotechnical market
- Developed novel soil parameter derivation method and validated models through experimental data analysis
- Implemented advanced numerical algorithms with iterative convergence techniques and boundary condition optimisation in FORTRAN90

### KTP Associate

January 2013 – January 2016

*Cardiff University / LUSAS, Cardiff / London*

- Developed two advanced soil models (Duncan-Chang and Hardening Soil) for LUSAS finite element analysis software, transferring research outcomes to industry
- Developed soil-fibre micro-mechanical composite model for enhanced material characterisation
- Supervised two MSc students, conducted literature review, and presented at national and international conferences
- Taught and assessed 4th year undergraduate programming course

### Computer Technician

2012 – 2019

*Self-employed, Hemel Hempstead*

- Established a small computer repair business. This involved market research, advertising, and client tuition.

## EDUCATION

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<b>PhD: Constitutive Modelling of Soils and Fibre-Reinforced Soils</b> Cardiff University	2013 - 2017
<b>MEng in Civil Engineering 1st class honours</b> Cardiff University	2009 - 2013
<b>A-levels</b> The Hemel Hempstead School	2002 - 2009

Mathematics	Further Mathematics	Information Technology	Physics	Music Technology
A	B	A	B	A

## SKILLS

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System architecture, Technical leadership, Agile methodologies, Mentoring and training, Microservice architecture, CI/CD pipeline design, RESTful API design, Cross-functional team collaboration, Python, Flutter, Full stack + API, Docker, Testing, MATLAB, MathCAD, HTML/CSS/Tailwind, NodeJS, MongoDB, SQL variants, LUSAS, FORTRAN90, Topbraid, Revit/AutoCAD, SketchUp, LATEX, Prezi, MS Office, Linux, Project management, Enterprise integration patterns

## PUBLICATIONS

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**Madhukumar, H., Bower, T. A., Vasilakos, X., Ullauri, J. P., Lema, M and Simeonidou, D** (2024). A Scalable and Distributed Hierarchical Architecture for Network Monitoring-on-Demand. *3rd International Conference on 6G Networking (6GNet), Paris, France*

**Breher, K., Terry, L., Bower, T., and Wahl, S.** (2020). Choroidal Biomarkers: A Repeatability and Topographical Comparison of Choroidal Thickness and Choroidal Vascularity Index in Healthy Eyes. *Translational Vision Science & Technology*

**Bower, T. A., Jefferson, A. D. and Cleall, P. J.** (2020). A reformulated hardening soil model. *Proceedings of the ICE - Engineering and Computational Mechanics*

**Bower, T., Jefferson, A. D., Cleall, P. and Lyons, P.** (2016). Modelling soil-fibre composite behaviour using a micromechanical approach. *7th European Congress on Computational Methods in Applied Sciences and Engineering, Crete, Greece, 5 - 10 June 2016*

**Bower, T., Jefferson, A. D., Cleall, P. and Lyons, P.** (2016). A micro-mechanics based soil-fibre composite model for use with finite element analysis. *UK Conference of the Association for Computational Mechanics in Engineering, Cardiff, UK, 31 March - 01 April 2016*

## AWARDS AND ACCREDITATIONS

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**Institute of Civil Engineers - Telford Premium Award - 2021** – for paper: A reformulated hardening soil model  
**Associate Fellow of Advance HE - 2020** – Accreditation for commitment to professionalism in higher education teaching and learning support

**PRINCE2 Practitioner - 2015** – Accreditation for the PRINCE2 Project Management Framework

## INTERESTS

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- Carpentry and woodworking
- Piano, organ, bass guitar, electric guitar, banjo, mandolin, harmonica
- Table tennis, cycling, hiking
- Surfing, bodyboarding, skateboarding, snowboarding
- Duke of Edinburgh Gold award
- Footpath clearing with the Pencoed Trailblazers