Thomas Bower

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Senior software developer with 12+ years 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 Principal Engineer opportunities to leverage deep technical expertise and leadership experience.

EXPERIENCE

Senior Software Developer July 2021 – present

Weaver Labs, London

- Telecoms sector - B2B private 5G Network as a Service provider in commercial and research sectors
- Architected a distributed monitoring system for 5G networks using WireMQ, Prometheus, InfluxDB, Grafana, Docker, K8s - Used in 2 private 5G installations
- Mentored 4+ PhD and Masters students in coding best practices, design-patterns, repo management, security, and testing
- Architected and delivered a full stack solution for fan engagement to 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

Woodworking January 2015 – present

Self-employed, Bridgend

- Creating wooden crafts including picture frames, clocks, furniture, and jewellery
- Selling crafts online
- Customer engagement with bespoke orders

Research Associate January 2019 – July 2021

Cardiff University, Cardiff

- Improved collaboration of research group by implementing shared codebases on GitLab
- Improved modularity and maintanability 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
- Communication with industrial partners
- Mapping and coding of compliance standards for construction projects
- Designing and implementing systems for automatic compliance checking using ontology
- Natural language processing and fuzzy logic
- Increased awareness of project and ideas with Conference attendance and article publication

Software engineer January 2016 – January 2019

LUSAS, London

- Delivered soil structural modelling algorithms, allowing the company to expand into the geotechnical market
- Conducted primary experimental data to validate the algorithms, giving customers assurance of model accuracy
- Introduced a new method to derive soil parameters, making the user experience easier
- Coding in FORTRAN90 following the company's style guide
- Documentation of code and results

- Integrated with non-linear Newton-Raphson algorithm and iterative approach to converge on stable solutions
- Identifying convergence issues and optimising boundary conditions

Cycle Courier January 2016 – January 2019
Deliveroo, Cardiff

- Customer and client facing role
- Road safety and route planning
- Public engagement via online blog

KTP Associate January 2013 – January 2016
Cardiff University / LUSAS, Cardiff / London

- Knowledge Transfer Partnerships facilitate the transfer of research from academic institutions directly into industry.
- Literature review of subject area
- Development of two advanced soil models: Duncan-Chang and Hardening Soil for use in LUSAS Finite Element Analysis software
- Development of a new soil-fibre micro-mechanical model
- Presenting at national and international conferences
- Supervising two MSc students and ensuring reliable experimental data
- Managing budget and training
- Teaching and assessing 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

PhD: Constitutive Modelling of Soils and Fibre-Reinforced Soils 2013 - 2017
Cardiff University

MEng in Civil Engineering 1st class honours 2009 - 2013
Cardiff University

A-levels 2002 - 2009
The Hemel Hempstead School

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

SKILLS

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

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

Institute of Civil Engineers - Telford Premium Award – for paper: A reformulated hardening soil model

INTERESTS

- 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