Frederick (Fred) Shone

✉ fredjshone@gmail.com London, UK

In Brief:	Key Interests:	Technical:
I am a **Researcher & Data Scientist/Modeler/Software Engineer** with diverse domain experience. I am currently a PhD student at UCL, using Deep generative models and Reinforcement Learning to add people into Digital Twins. I'm good at the big picture and at delving into intricate details. I like making things and explaining things.	**Agent Based Modelling / Simulations** – Applied ABMs as decision support tools. **Software Engineering –** Building and maintaining software tools. I am the author of PAM, an open-source python tool for activity-based modelling. **ML & Reinforcement Learning –** I am building the next generation of decision support models for transport, energy & health policy.	**Python** (standard DS stack + TF + Torch) *(7 years)* **Rust** *(2 years*) **Java/R/~bash** *(odds and ends)* **Git / Docker / CI&CD** **Cloud/AWS** (including step functions)

Professional Experience:

Researcher/PhD, UCL Behaviour and Infrastructure Group *September 2023 – ongoing*

Using **Reinforcement Learning** (RL) for massive scale human behavior **simulations**. I am currently working with **deep generative models** for rapid generation of massive, intricate, and realistic synthetic simulations.

- > Pam (github.com/arup-group/pam) – a python library for activity-based model development.
- > Caveat (github.com/fredshone/caveat) – a framework for generating agent activity sequences.
- > Biggym (httgithub.com/fredshone/biggym) – gymnasium RL environments for activity-based modelling.

Arup City Modelling Lab, Technical Lead *October 2018 – September 2023*

Instigating and leading the development and application of massive scale **Agent-Based Models**. Model and insights delivery for numerous clients worldwide, for transport, energy, and epidemiology. Leadership and team management. I also developed **Computer Vision** for pedestrian analytics from video footage.

Data Scientist/Engineer Intern, nPlan *July 2018 – August 2018 (part time)*

Extraction of construction schedules using Python, SQL and MongoDB. **Text** mining and **language modelling** for analysis of delays.

Principle Strategy Planner, Transport for London (TfL) *September 2015 – September 2017*

I instigated tools and processed for data driven decision making at TfL. My work focused on delivering Business Plans and Strategies in a data driven and measurable way.

Civil Engineer, Skanska Civil Engineering *2006 – 2015*

Project Management and design for various construction projects in the UK and abroad. Including secondments to Network Rail, Tony Gee and Partners and Skanska Romania. I managed and designed the construction of unique and challenging structural and civil engineering projects. I worked with international clients, consultants and contractors from a variety of sectors and professions.

Education and Qualifications:

PhD, Behaviour and Infrastructure Group, University College London *September 2023 – ongoing*

MSc, Economics (2.1), Birkbeck University *2016 – 2020 (part-time)*

MRes, Spatial Data Science & Visualisation (1st), University College London *September 2017 – September 2018*

MEng, Civil Engineering (2.1) University of Bristol *2004 –2008*

Skills and Achievements:

Technical/Data – I am experienced at building tools and insight from a diverse range of data types and domains.

Leadership & Communication – I am a successful team builder and influential speaker for a variety of audiences.

Software – I am experienced working in a software engineering team. I am the author of open-sourced python projects. I have also contributed to Java, R and Rust projects. I am practiced using MATSim, plus the standard python data science tooling, and AWS cloud services.

Coaching and Mentoring – I coach university and adult Ultimate Frisbee teams in London.

Ultimate Frisbee – I represented Great Britain at the 2015 European Championships. I am a three-time Club Nationals and Club European Champion.

Sailing – I was a member of the 2005 Olympic Development Sailing Team.