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**EMPLOYMENT HISTORY**

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- **Improbable Defence** 2020 - Present  
*Software Engineer*
  - **Python development:** Created a portfolio of agent-based models to aid NATO aligned organisations plan and prepare for sub-threshold warfare. Functionality included simulating civilian migration patterns, impact of infrastructure outages and the spread of misinformation.
  - **Data pipelines:** Development of an extensible data pipeline using Luigi that produces a combination of synthetic and real world human geographic data. Widespread internal adoption has led to the product being commercially licensed for use by external customers.
  - **Geospatial datasets:** Processing and extraction of geospatial data with PostgreSQL and PostGIS. Use of GeoPandas and QGIS for analysing and visualising model outputs.
  - **Model optimisation:** Delivery of high performance C++ model components to meet customer requirements for large scale real-time simulations of traffic on national road networks.
- **Football Radar** 2018 - 2020  
*Engineering Manager*
  - **People management:** Led the Football Modelling team. Managed a team of software developers, data scientists and system administrators.
  - **Product delivery:** Worked with the team to deliver a variety of new and upgraded predictive football models. Bespoke solutions for high value tournaments (Champions League, 2018 World Cup).
  - **System design:** Migration away from legacy monolith to new Scala services.
  - **Project management:** Managed projects using lightweight kanban. Encouraged delivering minimal viable products, with tight feedback loops and a philosophy of continuous improvement.
  - **Infrastructure:** Cut annual AWS costs by £100k+ through architectural changes, reserved instances and right-sizing.
- **Football Radar** 2016 - 2018  
*Software Engineer*
  - **Scala development:** Delivery of company strategic next generation model, predominately written in functional Scala using Akka and Finagle. Designed and built a number of backend services, scheduled jobs, debug pages and integrations with trading systems.
  - **GPU programming:** Enabled in-play football simulations by proposing and leading project to rewrite core monte-carlo simulator in C++/CUDA. Completion of the GPU accelerated simulator enabled new trading opportunities due to lower latencies.
  - **Verification and testing:** Improved speed, usability and affordability of AWS based model backtesting infrastructure through simplification, increased parallelism and performance profiling. Outcomes included a reduction in the runtime of certain model verification jobs from 2 weeks to under 24 hours.
- **UBS** 2011 - 2016  
*Software Engineer*
  - **Java development:** Backend services for managing data that required long term storage.

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**EDUCATION**

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- **University of Bristol** 2008 - 2011  
*2:1 Computer Science BSc (with Hons)*

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**TECHNOLOGIES**

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- **Languages:** Python, Scala, SQL **Tools:** AWS, GCP, Linux, Docker, Kafka, Terraform