

Technical generalist and machine learning researcher with 10 years experience in software engineering, data science, and machine learning research. Ph.D in computer science and proficient in multiple programming languages and tools. Passionate about machine learning, mathematics, and working on complex problems requiring a broad skillset.

SKILLS

Python: Extensive use for data analysis, machine learning, and building web applications.
Javascript, HTML, CSS, React: Proficient. built several application frontends.
AWS, Terraform: Experienced. Managed infrastructure for large, complex applications at AIG.
Hadoop, Hive, Pig: Experienced. Used at Jagex for ETL & analysis on terabyte-size datasets.
SQL: Good knowledge, especially with PostgreSQL.
Linux & shell scripting: Experienced.
R: Experienced, especially for data analysis and visualisation.
Rust: Good knowledge.
C, C++, C#, Java: Experienced, used in a variety of projects
Haskell: Experienced. Contributor to several open source projects
Git: Experienced (github account: <https://github.com/statusfailed>).
Mandarin Chinese: Approximately HSK 3

SELECTED WORK EXPERIENCE

Machine Learning Project Lead

London, United Kingdom

Sponsored by Ethereum Foundation

2023

- Conceptualized, pitched, and executed a Zero-Knowledge Machine Learning project for the Ethereum Foundation
- Implemented a deep learning framework in Python (yarrow) for gradient-based learning of arithmetic circuits
- Developed, implemented, and published a novel algorithm for symbolically computing gradients of circuits

Senior Full Stack Developer (Contract & Full-Time)

London, United Kingdom

American International Group (AIG)

2016 - 2022

- Used Python and Javascript/React to develop a web-based platform to sell cyber security insurance.
- Used Terraform to set up and manage project infrastructure
- Productionized NLP-based Python trading models developed by data scientists
- Collaborated with in-house IT to deploy and monitor trading models
- Integrated trading models with internal trading platform

Data Scientist

Cambridge, United Kingdom

Jagerx

2013 - 2015

- Real-time network monitoring and DDoS attack alerting using changepoint detection algorithms, including an interactive dashboard summarising attacks and their impact on the player base for the MMO game *RuneScape*.
- Real-time interactive dashboards for game client performance metrics for the FPS *Block N Load*.
- HTML5/Javascript visualisations, including an in-game activity replay tool, and an interactive weighted flow diagram of the game economy for *Transformers Universe*.
- Bayesian model of player activity to identify AFK players in *Transformers Universe*
- Taught Python to analysts for use in Hadoop streaming MapReduce jobs

Analyst Developer

Cambridge, United Kingdom

Featurespace Ltd.

2011 - 2012

- Implemented machine learning algorithms in C#, including the C4.5 decision tree and a Bayesian online change-point detection algorithm.
- Designed and implemented infrastructure for online machine learning applications
- Organised weekly reading group on new machine learning research

SELECTED PERSONAL AND OPEN SOURCE PROJECTS

Yarrow & Polycirc

Python

A datastructure for arithmetic circuits ('diagrams') and a library for zero-knowledge machine learning ('polycirc').

Catgrad

Python

A deep learning framework based using a novel algorithm to compute gradients.

EDUCATION & QUALIFICATIONS

Ph.D, Computer Science

University of Southampton

Offensive Security Certified Professional (OSCP)

OffSec

MEng, Computer Science and Electronics

University of Bristol

SELECTED PUBLICATIONS

Data-Parallel Algorithms for String Diagrams

Paul Wilson & Fabio Zanasi

Applied Category Theory 2023

Categories of Differentiable Polynomial Circuits for Machine Learning

Paul Wilson & Fabio Zanasi

International Conference on Graph Transformation 2022

Categorical Foundations of Gradient-Based Learning

Cruttwell, Gavranovic, Ghani, Wilson, & Zanasi

European Symposium on Programming 2022

Reverse Derivative Ascent: A Categorical Approach to Learning Boolean Circuits

Paul Wilson & Fabio Zanasi

Applied Category Theory 2020