
EDUCATION & QUALIFICATIONS

University of Southampton*Ph.D Candidate, Computer Science**December 2018 - Present (Expected 2022)***University of Bristol***MEng, Computer Science and Electronics (awarded 2.1, average grade 65)**September 2007 - July 2011***Offensive Security Certified Professional (OSCP)***Penetration testing professional qualification**February 2018***Interests***Category Theory, Machine Learning, Programming Languages, Formal Methods, High-Performance Computing*

SELECTED PUBLICATIONS

Reverse Derivative Ascent: A Categorical Approach to Learning Boolean Circuits*Paul Wilson & Fabio Zanasi**Applied Category Theory 2020***The Cost of Compositionality: A High-Performance Implementation of String Diagram Composition***Paul Wilson & Fabio Zanasi**Applied Category Theory 2021***Categorical Foundations of Gradient-Based Learning***Cruttwell, Gavranovic, Ghani, Wilson, & Zanasi**European Symposium on Programming 2022***Categories of Differentiable Polynomial Circuits for Machine Learning***Paul Wilson & Fabio Zanasi**International Conference on Graph Transformation 2022*

SELECTED WORK EXPERIENCE

American International Group (AIG)*Senior Full Stack Developer (Contract)*

London, United Kingdom

2020 - 2022

- Implemented NLP-based trading algorithms based on research by data scientists
- Collaborated with in-house IT to deploy and monitor trading models
- Integrated trading models with internal trading platform

Jagex*Data Scientist*

Cambridge, United Kingdom

May 2013 - August 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

Featurespace Ltd.*Analyst Developer*

Cambridge, United Kingdom

September 2011 - October 2012

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

New Oriental School*English Teacher*

Changsha, Hunan Province, China

July - August 2010

Taught english to 12-14 year-old students. Planned and taught lessons to complement a textbook. Corrected writing, held speaking practice session, and organised activities.

SELECTED PERSONAL AND OPEN SOURCE PROJECTS

Hypergraph Adjacency RepresentationsAn implementation of the HAR datastructure for representing string diagrams from *The Cost of Compositionality*.

Python

Numeric OpticsA machine learning framework based accompanying *Categorical Foundations of Gradient-Based Learning*.

Python

SKILLS

Haskell: Good knowledge, contributor to several open source libraries**Python:** Extensive use for data analysis, machine learning, and REST APIs.**C, C++, C#, Java:** Experienced, used in a variety of projects**Javascript, HTML, & CSS:** Proficient, built several web apps, some work with React.**Linux & shell scripting:** Good knowledge, used since 2005. Extensive use on AWS.**Amazon Web Services:** Familiar with many AWS products, including EC2, Route53, RDS and S3.**R:** Experienced, especially for data analysis and visualisation.**Git:** Intermediate (github account: <http://github.com/statusfailed>).**Rust:** Some use in personal projects**Elm, Go, Delphi:** Rusty, used in various projects**Mandarin Chinese:** Approximately HSK 2-3