gavin leech

AI research / technical generalist

about

g@gleech.org
Scholar
Twitter
Github
LinkedIn

programming (in production)

Python, Spark, Torch, PyMC3, Keras, *nix, Azure, C#, JS (ES6, node, TS), PHP, Pig, Powershell.

interests

Reviews
open science,
self-calibration,
failures of reasoning,
failures of reasoning about reasoning,
lists.

My main strengths are breadth (CS / econ / epi / phil / psych), writing, & judgment (@ page 2).

publications

Mass mask-wearing notably reduces COVID-19 transmission (2021), preprint

Seasonal variation in SARS-CoV-2 transmission in temperate climates (2021), preprint

Government interventions in Europe's second wave (2021), preprint

Safety Properties of Inductive Logic Programming (2021), SafeAI @ AAAI

How robust are COVID-19 estimates? (2020), spotlight paper at NeurIPS

The effectiveness of nonpharmaceutical interventions against COVID-19 (2020), *Science*

projects

Reversals in psychology: Collated evidence of the replication crisis. (Gelman, Heathers)

AI safety in academia: estimates & models of how much safety might be done indirectly.

ProlexaPlus: Brought modern language modelling (Flair) into Prolog for some reason.

Hardening the browser: Guide to beginners' infosec with emphasis on cost-benefit.

Side effects in Gridworlds: Implemented new environments, DQN, and MaxEnt IRL in Tensorflow. (Teamwork.) Written up here, code here, cited here.

The First Computers: Deployed. Conceptual analysis to solve a historical question.

education

PhD Interactive Artificial Intelligence, University of Bristol. Ongoing, 2023 finish. 1st year was a de facto research Master's, including uncertainty modelling, NLP, GOFAI, legal aspects. Thesis: fast probabilistic programming, or something.

MSc Software Development, University of Glasgow. 82% GPA. Java, SQL, HTML/CSS/PHP, assembly, plus design patterns, data structures & algos. Thesis in computational linguistics: 'Hidden Markov Models for Accommodation'

BSc Mathematics & Statistics, The Open University. 89% GPA. Probability up to diffusion processes, regression to GLMMs, numerics to BFGS, linear algebra to multi-linear, RCTs. Part-time during FT work. Reviewed here.

experience

2020 – 2021 **Researcher** EpidemicForecasting.org

Member of a large collaboration on COVID epidemiology (Oxford / Imperial / Harvard / other). Led the masks project and helped drive on second-wave and seasonality. Probabilistic programming, also technical writing, data collection, literature reviews, conceptualisation.

Buzzwords: PyMC3, Bayesianism, AWS, Azure, Seaborn, post-stratification

2019 – Now **Assistant Teacher** University of Bristol

Solo instructor in tutorials, training TAs. Bayesian ML & Algorithms 2.

Buzzwords: Gaussian processes, Markov Random Fields, Bayesian optima, variational inference, dynamic programming, graph theory, complexities.

2016 – 2019 **Data Scientist** AXA Insurance, London

Built dozens of ML models (GLMs, GBMs, deep neural nets) for actuarial pricing, medical risk, & image recognition. Tech lead for 5 scientists & engineers; web scraping at scale; migration from SAS to Hadoop, & Hadoop to Azure.

Buzzwords: Python, Spark, Keras, XGBoost, Tableau, Avro, Pytest, GDPR

2015 – 2016 **Software Developer** Freetobook, Glasgow

Improved a large legacy accommodation engine: PHP back-end, JS front-end, REST APIs. Sole design of a PCI compliant credit-card storage system.

Buzzwords: PHP 5 & 7, LAMP, SQL, Laravel, cURL, Gitlab, New Relic.

2015 **Software Developer** Stugo, Glasgow

Jumped into web dev; my code in worldwide production within 2 weeks. Products: a medicine pump device manager & a pharmacy record system.

Buzzwords: C#, WPF, node.JS, MEAN, Ractive, Mongo, Vagrant, VMware.

2014 **Assistant Statistician** The Scottish Government, Edinburgh

Made official statistics in the Education Analytics dept. Worked on a data viz platform for teachers. Prep for the national Social Care Survey 2015.

Buzzwords: SAS, SQL, PCA, data protection.

judgment

- Brier score of 0.16 after one year of PredictionBook.
- Top forecaster in Nuno Sempere's Value Forecasting Tournament.
- Judge on the Resolution Council of Parallel Forecast, a short-lived AI prediction experiment. Topics: timelines, macroeconomics, state-of-the-art performance.