Dr Nick Calvert

Data analyst interested in coding, data science, open research and deep learning

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Skills

Python (Numpy, Scipy, Pandas, scikit-learn, and fast.ai) **Julia (**MLJ Machine Learning package**), C++** (MC Simulation)**, MATLAB**

Data Analysis (frequentist and Bayesian methods, classification and prediction algorithms), **Algorithm Development** (linear and nonlinear optimisation algorithms), and **Inverse Problems/ Linear Algebra** (image reconstruction)

Experimental design (planning and design, data collection, coordination of analysis and presentation of results)

Containerization of code (Binder, Jupyter)

Collaborative working (collaborative document writing (Overleaf), version control (Git, GitHub), communication (Slack))

Work management (working to project deadlines and prioritising tasks)

Employment

Senior Research Scientist — Christie NHS Foundation Trust 2017 - 2019

- Data analysis and algorithm optimisation for image reconstruction and processing using Python
- Collaborative research, coding, and experiment work with multiple European research hospitals
- Data collection using experimental research, simulation modelling for development of novel cancer treatment

Scientist Engineer — Rapiscan Systems Ltd 2009 - 2017

- Developed linear and nonlinear optimisation algorithms for image reconstruction using MATLAB and C++
- Evaluated classification algorithms to identify malicious items (eg bombs) in freight
- Performed Monte Carlo simulations in C++
- Implemented algorithm into production in prototype metal detector

Selected Projects and Publications

Binderising "Doing Data Science" using Julia + Binder + nteract

- Re-creating exercises from the book Doing Data Science by Cathy O'Neil & Rachel Schutt in Julia (originally in R) and publishing them in an online Docker image of my GitHub repository using Binder

Drunken Salesman: Applying the travelling salesperson problem to Manchester Breweries

- Using Openrouteservice, Python, Julia, and Google Maps to plan the optimal Manchester craft brewery crawl

Peer-reviewed academic publications in *Medical Images*, *Physica Medica*, *IEEE Transactions on Nuclear Science* and more

- Full list of publications on Google Scholar profile: scholar.google.com/citations?user=yg5zgmQAAAAJ

Presented at a number of national and international conferences.

- Invited and proffered talks, including an invited talk at the European Association of Nuclear Medicine annual Congress 2019.

Education

PhD, Radiation Physics — University College London (UCL) 2012 - 2015

- Title: Time-of-Flight X-ray Compton Scatter Imaging
- Developed a novel x-ray imaging system, implementing reconstruction and data analysis algorithms in MATLAB and simulations using C++.
- Collaborated with AWE on a simulation study in x-ray scatter imaging and with LightPoint Medical where I simulated the generation of Cerenkov photons in human tissue to improve imaging
- Teaching and mentoring of undergraduate students in Engineering

Master of Research — Security Science, UCL 2011 - 2012

- Dissertation Title: Feasibility Study of Time-of-Flight X-ray Compton Scatter Imaging
- Training in: research methods, information security, risk analysis

Master of Mathematics — University of Manchester 2005 - 2009

- Dissertation Title: Gamma-ray tomography
- Training in: linear algebra, inverse problems, calculus