


# 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 (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](https://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