

JOSH PILKINGTON

www.jpilkington.com

Personal Statement

A highly motivated, organised and practical engineering graduate with significant experience in process optimisation and consulting. Able to work effectively on own initiative or within a team, and communicate proficiently at all levels. Particular strengths include heuristic optimisation of vehicle routing and manufacturing problems, process modelling, and development of robust analytics.

Employment History

Jan 2018 – Present **Swizzels Matlow Ltd (Derbyshire)** **Data Scientist (contractor)**

A full-time contracting position within a FMCG factory. As the initiator and sole developer of a full-stack web platform to optimise the production schedule for over 600 products across 80 machines, the project involved:

- Developing a completely custom algorithm, based on simulated annealing, that:
 - Solves for a broad range of soft and hard constraints, including shift patterns, seasonal production, machine history, variable downtime in product switchovers, amongst others
 - Creates daily production schedules against a sales forecast spanning up to one year
 - Runs in approximately one minute, allowing for exploratory analysis to examine the impact of e.g. changing shift patterns on the ability to meet the forecast. Overall, this more than halved the overtime spend for two departments and frequently freed up as many as eight operators in a single department
- Implementing a KPI dashboard that allows Senior Management, Supervisors and Machine Operators to review their performance and conformance to plan, integrating existing data sources e.g. web forms (FastField) submitted by shop floor operatives
- Configuring monitoring devices (both commercial units and Raspberry Pis) to get real-time production data from machines, interfacing with Programmable Logic Controllers (PLCs)
- Establishing and leading a weekly knowledge-sharing session, to support the IT department and other interested employees in developing Python knowledge and proficiency
- Utilising Pandas, NumPy, Flask (incl. supporting libraries), PostgreSQL and SQLAlchemy, JQuery, Bootstrap, plotly.js, Nginx, Unicorn, PyModbus and other libraries

Jul 2017 – Sept 2017 **Tesco PLC (London)** **Data Scientist (contractor)**

A fixed-term contract to facilitate the rollout of a £6m, in-house vehicle routing system across over 300 stores across the UK. Key responsibilities and achievements included:

- Monitoring technical performance of the algorithm and assisting with load balancing across servers:
 - Automated analysis of server logs (Splunk) to review server performance
 - Created scheduled jobs on the Hadoop cluster to aggregate data for KPIs

- Developed a library to improve parameter tuning of the algorithm using Response Surface Methodology (RSM), which assisted with the balance between breadth- and depth-first searches
- Benchmarking of algorithm performance against previous 3rd Party solution:
 - Created a dashboard that compared performance of the in-house solution against the previous implementation, to evaluate the ROI
 - Delivered results to Directors at regular intervals to communicate progress

Apr 2015 – May 2017

Fetchr (Dubai, UAE)

Lead Data Scientist

A full-time, predominantly remote role for a Dubai-based technology startup in the logistics industry, covering a broad range of data analysis and data science projects. Key projects and achievements include:

- Led the development and implementation of an in-house vehicle routing solution for fleet management that:
 - Optimised routes for up to 10,000 daily pickups/deliveries, taking into account multiple constraints; customer time slots, vehicle types, real-road travelling distance/time, vehicle capacities, etc.
 - Rapidly recalculated routes to handle dynamic situations such as customer availability and on-demand scheduling
 - Involved a full-stack implementation utilising a self-hosted OSRM server for matrix generation, a mixture of heuristics and metaheuristics developed in Java and NumPy, and an interactive frontend
 - Assisted the largest open-source vehicle routing library (Jsprit) in developing a viable method for accommodating driver lunch breaks in routes, becoming one of 13 named contributors on their GitHub
- Built an interactive simulator to assist in business forecasting:
 - A web application for the Operations team to define constraints for multiple scenarios
 - Calculated the operating cost and personnel requirements associated with new client contracts, based on their specific requirements
- Product owner of the BI reporting tool (RJMetrics):
 - Liaised with all heads of department to develop KPIs and maintained dashboards to report on key metrics within the business
- Multiple ad-hoc projects as required by the business:
 - Multivariate regression analysis to better understand trends in customer behaviour and anticipate problematic service users
 - Working with both the Product and Marketing teams to implement, analyse and respond to the outcomes of A/B testing

A sponsored research position (initially a PhD) based in the Department of Chemical and Environmental Engineering, focussed on process optimisation for anti-malarial drug manufacturers. Key responsibilities and achievements include:

- Project management of multiple industry-sponsored research projects, on behalf of manufacturers based in China and Africa, in addition to international academic collaborators
- Formally communicating regular updates and research outcomes to stakeholders for direct implementation on industrial scale
- First authorship of two peer-reviewed journal articles and presenter at multiple conferences, including:
 - Pilkington, J. L., Preston, C. and Gomes, R. L. (2014) Comparison of response surface methodology (RSM) and artificial neural networks (ANN) towards efficient extraction of artemisinin from *Artemisia annua*. *Industrial Crops and Products*, 58, 15-24
 - Invited speaker at the Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, Germany (Nov 2013)
 - Oral presentation at the 9th World Congress of Chemical Engineering, Seoul, South Korea (Aug 2013)
- Management of student projects:
 - Supervised three Masters' students, defining the project scope and ensuring delivery for dissertation, in addition to managing several work experience students and technical staff
 - Designed and implemented Standard Operating Procedures, and delivered training to ensure both safe equipment use and robust experimental results

Education and Qualifications

2007 – 2011 1st Class MEng (Hons.) Chemical Engineering with Environmental Engineering

- J C Mecklenburgh Prize for Most Outstanding Design Project (2011)
- BP Achievement Award (2010)
- Annual achievement-based Departmental Scholarship (2007-2011)
- Member of the Faculty of Engineering High Fliers Scheme

The University of Nottingham

1999 – 2006 A-Level: Chemistry (A) Biology (A) Mathematics (B) and History (B)

GCSE: 6A*, 3A and 1B, including English Language (A*) and Mathematics (A)

The Manchester Grammar School

Interests and Activities

Outside of work, I am self-taught on the piano and enjoy playing most evenings, in addition to playing pool in the local league. I actively participate on Stack Overflow in my spare time, to further my understanding of programming in general, and assist others; due to my contributions, I was made a Room Owner for the main Python chat room for the site, where I carry out moderation duties.