

# Dr Neil Swainston

BSc (Hons) MSc PhD

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## Summary

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- Bioinformatics, scientific software engineering, data science and machine learning in academic and commercial environments.
- Specialisms in systems and synthetic biology, including 'omics data analysis and management, metabolic modelling, metabolic engineering, enzyme engineering, laboratory automation.
- Proficient in full-stack software development in Python, Java, Javascript and related technologies.
- Highly experienced in working in interdisciplinary teams.
- Strong scientific credentials, with ~70 peer-reviewed scientific papers, 16 of which have >100 citations; h-index: 30. <https://scholar.google.com/citations?user=bc32feUAAAAJ>.
- BSc Chemistry with Industrial Experience (first); MSc Computing Science; PhD Computer Science.
- Team Leading and Project Management in industry.
- International work experience in Germany and France.
- Multiple successful grant applications (>£1.9M funding).

## Computational and software development skills

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- Languages: Python, Java, Matlab, C/C++.
- Web and API development: Javascript, AngularJS, Bootstrap, Flask, ajax, JQuery.
- Data science: numpy, scipy, pandas, scikit-learn, keras, TensorFlow, PyTorch.
- Cloud computing: Google App Engine, Google Compute Engine.
- Data management: XML, JSON, relational, XML and graph (neo4j) databases.
- Software engineering: source code control (svn, git), build and deployment scripts (ant, Maven, Docker), software design with UML.
- Operating systems: OS X, Windows, Linux.

## Employment

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12/20- **Mellizyme Biotechnology Limited** Senior Computational Researcher

- Responsible for developing computational and software infrastructure to support the full Design-Build-Test-Learn cycle of a synthetic biology focussed biotechnology start-up.
- Duties include: development of software to support the design of synthetic DNA; lab-automation; data management and analysis of scientific assay data; automation of DNA sequence analysis; cloud computing; project management and team leading.

06/17 - 04/21 **GeneGenie Bioinformatics Limited** Freelance Software Developer

- *Bitzer Kuehlmaschinebau GmbH, Sindelfingen, Germany.* Development of a web-based document management system. Technologies used: Python, Flask, AngularJS, Bootstrap.
- *Eigen Ltd., Leatherhead, UK.* Development of a Neo4j graph database solution to support oil rig project management systems. Involved working with the client and a distributed team of developers to port an existing relational database to an expanded Neo4j-based solution. Technologies used: Neo4j, Cypher, SQL, Python, Java.
- *YouSeq Ltd., Southampton, UK.* Development of a web-based system for DNA design and DNA sequencing data analysis. Involved frequent meetings with the client, which as a start-up had dynamic requirements. Technologies used: Python, Flask, AngularJS, Bootstrap.
- *Augmented Insights, Inc. Greenwich CT, USA.* Development of a proof-of-principle graph database to integrate nutritional data from a range of sources. Technologies used: Neo4j, Cypher, Python.
- *Upwork.* Numerous short-term contacts with on-line contract agency. Currently Top-Rated developer with 100% Job Success score and consistently positive feedback (see <https://www.upwork.com/fl/neilswainston>).

07/19 - **University of Liverpool** Senior Research Associate  
*Institute for Integrative Biology*

- Development of an integrated, cloud-based web-application to support DNA design and automated assembly, integrating with lab-based robotic systems. Involves full-stack development, with backend in Python, web-service development in Flask, UI development with AngularJS and Bootstrap, and cloud deployment with Docker on Google App Engine and Google Compute Engine.

04/06 – 06/19 **Manchester Institute of Biotechnology** Senior Experimental Officer  
*Centre for Synthetic Biology of Fine and Specialty Chemicals (SYNBIOCHEM)*

- Development of web-based software and scripts to support synthetic biology and industrial biotechnology research. Involved working with a team of interdisciplinary researchers to produce software support for the development of cell factories for chemical production.
- Mathematical modelling of biological systems. Involved development of linear and ODE models to simulate metabolism in human, yeast and bacterial cells. My role involved co-leading an international team of scientists to produce “the Google Map of human metabolism” (see <https://www.wired.co.uk/article/map-of-human-metabolism>).
- Raised ~£1.9 million in funding across a range of projects.
- Publicly available source code available at <https://github.com/neilswainston>.

04/99 – 04/06 **Waters Corporation** Bioinformatics Team Manager

- Commercial software development, as applied to scientific software development for a leading multi-national laboratory equipment company.
- Involved development of desktop and web-based applications for analytical chemistry data analysis. Technologies used: Java, Javascript, Visual C++.
- My role progressed from software engineer, through to a team leader and ultimately a project manager, directly managing a group of five people and being responsible for a software release involving the work of nine developers.
- This role was interdisciplinary, covering all facets of the software development life cycle, from requirements gathering, software design, development and documentation, through to testing and support. Due to the focus on requirements gathering from users, and providing software support, I was frequently involved in customer site visits, user training, and conference speaking; tasks which greatly developed my skills of collaborating across scientific disciplines.

10/98 - 04/99 **AstraZeneca** Graduate Trainee

- Graduate Trainee in IT problem management and data analysis.

09/94 - 08/95 **Dow Chemical Company, Stade, Germany** Student Placement

- Year-long placement in a varied role involving analytical chemistry. Duties involved lab research, plant visits, provision of analytical chemistry support, and development of a searchable database resource of spectra of chemical standards, presentation giving in both English and German.

## Education

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- 03/12 **PhD** “Systems biology informatics for the development and utility of genome-scale metabolic models”. *University of Manchester*
- 09/97 – 10/98 **MSc Computing Science** *University of Newcastle-upon-Tyne; IRISA, Rennes, France.* Year-long conversion course including MSc project in bioinformatics, undertaken in Rennes, France.
- 09/92 – 06/96 **BSc (Hons) Chemistry with Industrial Experience** *University of Manchester*  
First class honours; industrial experience in analytical chemistry with Dow

Deutschland Inc., Stade, Germany.

### Courses and training

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- **University of Manchester:** Practical project management; Collaboration: the hidden research skill; Communicating with your teams; Getting the best out of yourself and others; Coaching and mentoring skills; Practical application of supervision skills.
- **Coursera:** Introduction to Genetics and Evolution; Calculus One; Astrobiology and the Search for Extraterrestrial Life; Machine Learning; Agile Project Management (in progress).
- **Peter Kenyon:** The Front-Line Manager.
- **Pentland Training:** Project Management Fundamentals.