

DAN UNDERWOOD

Senior Software Engineer & Scientist

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EXPERIENCE

Senior Software Engineer

Genomics England

Nov 2022 – Present

London, UK

- Backend development/devops and management for a genomic healthcare service;
- Design and engineering of various ETL pipelines and tooling for transformation and analysis of clinical data, and refactoring of legacy systems;
- Communicating internally with engineers and scientists and externally with customers to understand requirements for data ingestion, processing and interpretation of outcomes;
- Technologies used:** AWS, Django, Docker, PostgreSQL, Python, React.

Senior Software Engineer

Riverlane

July 2018 – Nov 2022

Cambridge, UK

- Early employee working on research, development and management for a quantum computing software startup;
- Development of novel software algorithms and distributed control system tools for emerging quantum computing technologies;
- Building robust, scalable codebases and engineering processes from the ground up;
- Collaborating closely with academics and engineers to fully understand requirements of software/hardware co-design for maximum performance;
- Public engagement, outreach, networking, recruitment, and shaping the direction and focus of the company during multiple growth phases;
- Technologies used:** C++, Docker, Python, SystemC, Verilog, general HPC (MPI, OpenMP).

Research Associate

Department of Computer Science and Technology University of Cambridge

February 2017 – July 2018

Cambridge, UK

- Research and software development for the Isaac Physics project: <https://isaacphysics.org>;
- Full stack development/devops of online learning platform;
- Engineering of backend data pipeline and tooling to facilitate user feedback and behaviour analysis;
- Liaising with project outreach staff and content creators to understand user requirements;
- Technologies used:** AngularJS, Docker, Java (Jetty), Kafka, PostgreSQL, Python.

EDUCATION

PhD in Physics

University College London

London, UK, 2016

MSci in Astrophysics

University College London

London, UK, 2011

TECHNOLOGIES

Coding

Python

C#

Java

Javascript

C++



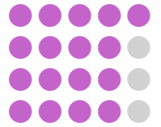
Data

SQL

Kafka

MongoDB

RabbitMQ



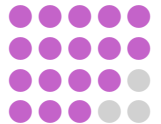
Devops

Docker

Git/Github/Gitlab

AWS

Jenkins



Web

Frontend: AngularJS, jQuery

Backend: Django, Express.js, Flask

SOFT SKILLS

Agile Development, Independent & Team Working, Interviewing & Recruitment, Line Management, Networking, Public Speaking

INTERESTS

Professional

Computational Chemistry, Data Science, Machine Learning, Quantum Physics, Software Engineering, Web Development

Personal

Art & Design, Fitness, Music, Reading, Travel

Software Engineer

Various

📅 March 2016 – February 2017 📍 Vancouver, Canada/Cambridge, UK

- *Stemcell Technologies*: development and modernisation of in-house, project life-cycle management applications, porting and refactoring of legacy code to a more modern, re-designed system;
- *Janus Technology*: engineering and testing of driver software for control systems and IoT devices, development of firmware as well as user interface applications;
- **Technologies used**: C, C#, Java, MQTT, MSSQL, Python.

PhD Researcher

ExoMol Group University College London

📅 April 2012 – December 2015 📍 London, UK

- Development of high-performance computational chemistry codes for the generation of spectroscopic data of interest for astronomical and industrial applications;
- Optimisation of code on high-performance computing architectures;
- Data extraction and result analysis, publication to scientific literature;
- **Technologies used**: C++, Fortran, Python, general HPC (MPI, OpenMP).

Developer

Intuitive Ltd.

📅 August 2011 – April 2012 📍 London, UK

- Full stack development of technology solution used by many large travel company websites;
- Backend and frontend development of both the clients' content management system as well as their customer-facing website;
- **Technologies used**: C# (ASP.NET), Javascript, JQuery, MSSQL.

ADDITIONAL ACTIVITIES

Teaching

Undergraduate Supervisor

Department of Computer Science and Technology University of Cambridge

Supervision of undergraduates. Preparing, coordinating and delivering tutorial sessions on a weekly basis for various lecture courses. Courses taught: *Quantum Computation, Databases*.

Demonstrator

University of London Observatory University College London

Laboratory and observatory demonstration for undergraduate and postgraduate students. Providing continuous assessment via the marking of coursework. Usage of telescopic equipment and recording of data.

PUBLICATIONS

ExoMol molecular line lists - XVII: The rotation-vibration spectrum of hot SO₃

D. S. Underwood et al

MNRAS 📅 2016

<http://dx.doi.org/10.1093/mnras/stw1828>

The ExoMol database: Molecular line lists for exoplanet and other hot atmospheres

Jonathan Tennyson et al

J. Mol. Spec. 📅 2016

<http://dx.doi.org/10.1016/j.jms.2016.05.002>

ExoMol molecular line lists - XIV: The rotation-vibration spectrum of hot SO₂

D. S. Underwood et al

MNRAS 📅 2016

<http://dx.doi.org/10.1093/mnras/stw849>

Rotational spectrum of SO₃ and theoretical evidence for the formation of sixfold rotational energy-level clusters in its vibrational ground state

D. S. Underwood et al

J. Chem. Phys. 📅 2014

<http://dx.doi.org/10.1063/1.4882865>

An ab initio variationally computed room-temperature line list for SO₃

D. S. Underwood et al

Phys. Chem. Chem. Phys. 📅 2013

<http://dx.doi.org/10.1039/C3CP50303H>