Nat Lund

Curriculum Vitae

Nathaniel J. Lund
British Citizen and
New Zealand Citizen
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Physicist venturing into software development. Passionate about code readability and clear technical writing.

Web **Github Account:** https://github.com/natlund

Computer Skills

Python

Python libraries: SQLAlchemy, Matplotlib, Pandas, Numpy, Scipy, Keras

C++, SQL, LaTeX

Linux, Git, Bash, Jenkins, Agile development

Amazon cloud services, Django web framework

Communication Skills

Written **Technical Writing:** PhD thesis noted for outstanding depth and clarity.

Tutoring **codebar** participation: Volunteer tutoring in minority-friendly environment.

Work History

Aug 2018 – Present **Data Engineer**, Flexciton, London UK, www.flexciton.com.

Flexciton helps industrial factories solve the problem of production scheduling, by providing a web interface to a state-of-the-art scheduling optimisation algorithm.

- Worked on the repository code layer that translates between a Postgres database and Python domain model objects using the sqlalchemy library.
- General back-end development in the Flask web app.
- Wrote an Ontology, working with all stakeholders to converge on definitions of all key concepts, and creating schematic diagrams of the conceptual relationships.
- Wrote documentation, including docs that reduced the on-boarding time for a new developer from three days down to one day.

Sep 2016 – May 2018 **Software Engineer, Data Scientist**, Metail, Cambridge UK, www.metail.co.uk.

Metail is a fashion-tech startup that builds virtual fitting-room 3-D modelling technology for use on fashion retail websites, and provides a digital composite photography service.

- **Data Science** Various ad-hoc business analyses, typically using Python and SQL to query an Amazon Redshift database, and Python pandas for data processing.
- Maintained and extended Looker, a graphical business intelligence tool. Trained users.
- **Physics Modelling** Learnt C++, and analysed and documented an 8,000-line physics modelling code that had been untouched for 5 years. Did minor refactoring and extension.
- Wrote 40 pages of technical documentation and 80 slides of diagrams detailing the physics modelling code. Explained how it works to non-technical users.
- **Machine Learning** Converted an image segmentation Convolutional Neural Network from the R&D team into Python code. Helped deploy it as a microservice on Amazon.

Jun – Aug 2016 **Data Analyst**, BOOKING.COM, Cambridge UK, www.booking.com.
Worked in the Pay-Per-Click Webmarketing department of a large internet travel retailer, writing Python code to do data analysis and automate various business processes.
- Text-processing to automatically shorten hotel names to fit into advertisement formats.
- Developed scoring system to rate relevance of advertising copy to search query terms. Wrote code to score advertisements, generate a table of actionable items, and email the table to automatically assigned Account Managers.

Jun 2014 – Mar 2015 **Data Scientist**, PUBLONS, Wellington NZ, www.publons.com.
Worked in a rapidly-growing internet startup using the Python web framework Django. Main projects included data cleanup, name disambiguation, text matching, search, and statistics. Additional work included basic web programming, and user interface design.
- Wrote heuristic code to flag suspicious data, thus enabling data cleanup.
- Researched string matching algorithms, and implemented a modified version that gave best results for matching names.
- Built a prototype search engine from basic Python language processing and linear algebra components.

Tutoring

2005 - 2006 One-on-one mathematics tutoring of a student with Asperger's syndrome.

2004 Small-group tutoring of first-year mathematics.

Education

2014 **PhD in Theoretical Physics**, *Victoria University of Wellington*, New Zealand.
Fluid Mechanics (Microfluidics)

2006 **BSc Honours in Physics**, *Victoria University of Wellington*, New Zealand.
First Class Honours

2004 **BSc in Mathematics and Physics**, *Victoria University of Wellington*, New Zealand.

Doctoral Thesis

Title *Effective Slip Lengths for Stokes Flow over Rough, Mixed-Slip Surfaces*

Supervisor Professor Shaun Hendy

Description The motivation was the recent development of surfaces patterned on the nano scale that offer reduced drag to liquids flowing over them. The physics was modelled as incompressible Stokes flow with a rough, periodic boundary condition. Analytic solutions were obtained by the perturbation and homogenization methods, yielding a prediction of the improved flow of liquids over nano-patterned surfaces.

Examiner's Remark "[This] chapter describes ... fluid mechanics concepts with a **depth and clarity which is very rarely found even in classical fluid mechanics textbooks**. It is an absolute pleasure to read... The candidate does a very good job of explaining complex concepts with clear and concise arguments."

Interests

- Economics
- Philosophy of Science
- Guitar
- Music from Bluegrass to Heavy Metal