Matthew Steel

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I'm a motivated software developer and business analyst seeking an IT position that will take advantage of my mathematical and theoretical background. I have a strong programming capability, and experience applying myself to highly technical modelling projects with both reliability and flair.

EDUCATION

The University of Auckland 2005-2008
BE (Hons) Engineering Science **1st Class**

A versatile degree combining applied mathematics and computing, aimed at broad practical applicability to industrial and business-related problems. This specialisation focussed on operations research, numerical algorithms and modelling concepts, which I complemented with a range of elective computer science papers.

- Final year project: implementing and extending and optimising algorithms for road-traffic prediction, testing convergence properties on real-world networks.

Outcomes

- A firm grounding in operations research techniques and other numerical algorithms,
- A rich mathematical modelling "toolbox,"
- Intensive use of object oriented C++ and Java throughout, experience in Javascript, Python, Matlab, R, PHP and Fortran 77.

Achievements

- John C. Butcher Award in Theoretical Computer Science
- ACM Programming Competitions
  - South Pacific super-regional champion, ACM ICPC World Finals 2008
  - South Pacific regional champion, ACM SPPC 2007

Whangarei Boys' High School 2000-2004
National Certificate in Education Achievement (Level 3)

- Scholarship-level pass in Mathematics with Statistics
- Second in school, Mathematics with Statistics
- Second in school, Physics

Coursera.org 2013-
9 completed courses from world-leading universities such as Stanford, Columbia and Georgia Tech. Topics include machine learning, computational finance and mathematics.

Certificates and transcripts are available at www.repsilat.com/certs.html.

PROFESSIONAL EXPERIENCE

Systemwide (now URS Australia), Melbourne 2010-2012
Transport Consultant, Full-time

At Systemwide my core responsibilities were to design, implement, test and document models for our clients in freight and passenger rail industries, including

- Discrete-event simulations of large-scale supply chains,
- Train dynamics models for performance and fuel consumption statistics,
- Forecasts of infrastructure and stock requirements under various growth and operational scenarios.

I also compiled reports and presentations for client consumption.

Skills acquired, exercised

- Simulation modelling in Arena,
- Lots of Excel, including VBA,
- Rail-related tools and domain-knowledge,
- A rigorous quality control ethic.

OTHER RELEVANT SKILLS/EXPERIENCE

Programming langauges

- Proficient in C++, including C++11
  - Extensive use of the STL,
  - Use of Boost,
  - Some use of graphics libraries, including SFML and SDL. Exposure to OpenGL (fixed-function and programmable pipeline.)
- Experience with Java, Python, Javascript (incl. jQuery, some WebGL),
- Basic knowledge of SQL, HTML.

Other tools

- Proficient in Matlab/Octave,
- Proficient in Excel (incl. VBA),
- Familiarity with Arena simulation software,
- Some experience with R,
- Proficient in Bash, comfortable in Linux in general (SSH, screen etc.)

Personal Projects (at www.repsilat.com)

Unduress.com

- An encryption service to provide “duress passwords” that will render data permanently inaccessible even when attackers back up the ciphertext.
- Implemented in Bash (front-end) and Python (back-end).

Numerical routines for road traffic network modelling

- A continuation of my final-year engineering project. High-performance code for estimating steady-state traffic levels
- Implemented in C++.

Mixed-integer program solver

- Solves optimisation problems with linear objectives, linear constraints and integrality constraints on a subset of the decision variables. Uses the branch-and-bound method on LP relaxations.
- Implemented in C++.

Raycasting project

- An experiment in alternative rendering techniques and strange geometry, inspired by MC Escher.
- Implemented in C++ and OpenGL, porting to JS/WebGL.

Other programs

- Algorithms for steganographic hiding of information in images, in Java.
- Sudoku solver, written on a plane instead of doing the puzzle myself... C.
- Simple games (“Asteroids”, “Space Invaders”) in Java/Swing and C++/SFML.