Dr. Paul Crane

paul@crane.net.nz • paul.crane.net.nz <https://paul.crane.net.nz> • Github <https://github.com/pcrane>
• LinkedIn <https://www.linkedin.com/in/paulscrane/> • Google Scholar <https://scholar.google.co.nz/citations?user=kjrHeXQAAAAJ>

Computer scientist, recently completed PhD, who enjoys teaching and working alongside others with different skill-sets. Most of all, likes rising to a technical challenge.

Education

PhD - Computer Science

An Indoor Localisation System Based on Ubiquitous Technology <http://hdl.handle.net/10523/7564>
August 2012 - Feburary 2017 (Defended June 2017; Graduation December 2017) **University of Otago <http://cs.otago.ac.nz>**

Indoor localisation systems are concerned with locating people or devices indoors without the support of GPS. A key challenge is to derive accurate location estimates. The thesis explores, and improves upon, the accuracy of two different signal strength based approaches. The final contribution is to reduce the effort needed to deploy an indoor localisation system via crowd sourcing.

MSc - Information Science

Beacon - A Rapidly Deployable Cellphone Network <http://hdl.handle.net/10523/2267>
July 2010 - December 2011 **University of Otago <http://www.otago.ac.nz/info-science/>**

Postgraduate Diploma in Science - Telecommunications

The Future of Telephony
March 2010 - December 2010 **University of Otago <http://www.telecom.otago.ac.nz>**

Publications

CRAFT: Reducing the effort for Indoor Localisation

with Zhiyi Huang, Haibo Zhang, *IEEE 28th Annual International Symposium on Person, Indoor and Mobile Radio Communications (PIMRC)*, pp. 1-6, 2017
Montreal, Canada.
paper **citation**

Emender: Signal filter for Trilateration Based Indoor Localisation

with Zhiyi Huang, Haibo Zhang, *IEEE 27th Annual International Symposium on Person, Indoor and Mobile Radio Communications (PIMRC)*, pp. 1-6, 2016
Valencia, Spain.
paper <https://paul.crane.net.nz/publications/pimrc2016/pimrc2016.pdf> citation

SIB: Noise Reduction in Fingerprint-based Indoor Localisation using Multiple Transmission Powers

with Zhiyi Huang, Haibo Zhang, *Proceedings of the 13th International Conference on Mobile and Ubiquitous Multimedia*, pp. 208-211, 2014
Melbourne, Australia.
paper <https://paul.crane.net.nz/publications/mum2014/mum2014.pdf> citation

Projects

Each of the projects listed below were completed concurrent with PhD as paid work. All the projects involved aspects of requirements gathering, design, development, testing, and performance tuning. These projects were all conducted as sole software developer. See the **projects page <https://paul.crane.net.nz/projects.html>** for more detail.

Real-time Neuro-feedback

Research Assistant, Phoebe Neo, Department of Psychology, University of Otago, March 2017 - present

This research project in the Psychology department aims to discover ways to reduce depressivity. I implemented a real-time neuro-feedback task according to an experimental protocol, and developed programs to analyse the data collected.

Information Display

Contract Software Developer, Joe Connolly, ITS, Downer Group, July 2017 - present

At Downer I was tasked with displaying road safety information around Downer's offices, Downer's client's offices, and public information booths across the country. Because the information is being displayed in their client's premises and in public areas, the priority of requirements were thus: reliability, functionality, then cost. Using a RaspberryPI, a small battery powered UPS (UPS PIco), and monitoring of the system (including CPU, RAM, hard disk) allowed us to keep tabs on the performance of the devices in the field. The RaspberryPI was connected to a wall-mounted TV in the offices to display the content. Controlling the devices was done through the use of message queues and a web-based administration interface.

Network Management Course Content Refresh

Technical Writer, Zhiyi Huang, Department of Computer Science, University of Otago, October 2017 - present

Since the course was last updated in 2010 there have been a large number of changes to the commands, tools, and general practises around Linux administration. Beyond the content of the refresh, the course web page was updated to use modern (responsive) web design practises, and the lab manual build process was updated to use modern continuous integration techniques to automate as much as possible (where the previous build system used docbook and makefiles to generate the lab manual).

Supporting Energy Monitoring At University of Otago

Designer & Software Developer, Hans Pietsch and David Eyers, Property Services Division and Department of Computer Science, University of Otago, July 2016 - December 2016

In this project I worked with a multi-disciplinary team at the University of Otago to collect and collate a variety of energy related measurements from a disparate set of systems (e.g. building management systems, lighting systems, ad hoc sensors) at a high level of geographic (e.g. room, floor, building, and campus levels of detail) and temporal precision (most commercial systems only persist aggregate data). The prototype system was presented at the Otago Energy Research Centre's Symposium in 2016, and awarded Best Student Presentation.

Accelerometer Gloves

Designer & Software Developer, Liz Franz, Department of Psychology, University of Otago, 2013 - 2014

In this project I designed, developed, and prototyped a set of accelerometer gloves to replace and improve upon a set of gloves that had gone out of production. The design of the new gloves achieved a sample rate of 125Hz (matching the existing pair), while improving upon the comfort level across a variety of different hand sizes and shapes.

Technical Knowledge

Daily	Python • Java • C	**Version Control**	git • subversion
Familiar	LaTeX • R • MatLab • HTML/CSS/Javascript	**Databases**	SQL • NoSQL • Timeseries
Novice	Go • C++ • C#	**Systems**	Linux (debian flavours) • IoT

Teaching Experience

I have been employed demonstrating labs for numerous undergraduate courses concurrent with postgraduate studies. Lab demonstrators have similar responsibilities to a teaching-assistant. The main role is to assist students with the practical lab work and help them to understand concepts taught in lectures.

Paper	Title	Skillset	Years
COMP160	Computer Programming <http://www.cs.otago.ac.nz/comp160/>	Java	2005,2007
COSC241	Programming and Problem Solving <http://www.cs.otago.ac.nz/cosc241/>	Java	2009,2010,2012,2017
COSC242	Algorithms and Data Structures <http://www.cs.otago.ac.nz/cosc242/>	C	2006,2007,2009,2010,2011,2017
COSC243	Computer Architecture and Operating Systems <http://www.cs.otago.ac.nz/cosc243/>	theory	2007,2012,2013
COSC244	Data Communications, Networks, and the Internet <http://www.cs.otago.ac.nz/cosc244/>	theory, Java	2007,2009,2010,2012,2013
COSC301	Network Management <http://www.cs.otago.ac.nz/cosc301/>	Linux, Ubuntu	2013,2014,2015,2016,2017

Anonymous Student Feedback

The following feedback was obtained by end-of-semester student evaluation questionnaires:

- "Paul was very helpful and cleared up any misunderstandings."
- "Paul performed his herculean task with grace, empathy, and deep understanding of the material."
- "The lab demonstrator is very helpful."

Administration

COSC301 Administration

Given the structure of the paper (50% internal assessment) and as sole demonstrator I was responsible for recording student marks, granting extensions, administering practical tests to classes of around 50 students each year.

West Coast Swing Dance Community

Planning classes, teaching, and supporting a local dance community for weekly lessons. Along with promoting national events and organising for overseas teachers to teach workshops over weekends.

Hobbies

Routinely attend Ceroc and West Coast Swing partner dancing classes, and occasional competitions.

I played Saxophone (jazz band and symphonic) for numerous years in local amateur groups.