Paul Crane

Architect at Diffblue

Software Engineer interested in solving hard problems, delivering results, and pushing technical boundaries.

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- Google Scholar
  <https://scholar.google.co.nz/citations?user=kjrHeXQAAAAJ>
- Stack Overflow
  <https://stackoverflow.com/users/8884278/paul-crane>

Employment

Architect

Diffblue
March 2019 - present

Diffblue is a small company that spun out of Oxford University in 2016. Diffblue Cover is a tool that automatically generates units tests for Java code. It uses reinforcement learning to enable development teams to deliver higher quality software, faster.

Responsibilities

- Shape the big picture and company vision, improve the product's architecture, tooling, build-system
- Management, planning, estimation, and development of features and releases in a timely manner
- Mentor and manage engineers in an agile environment through team stand-up discussions, code reviews, and company-level technical discussions
- Gather requirements and provide expertise in discussions with management, stakeholders, and quality assurance testers
- Assist with triaging and prioritisation of bugs and proactively raising issues and blockers as appropriate

Achievements

- Re-designing the web-based reporting application from the ground up
- Developed the foundations for key modules of Diffblue Cover's UI
- Lead the technical integration of licensing allowing direct sales to customers
- Designed and developed GUI tests for IntelliJ plugin enabling faster release cadence
- Introduced code linters, static code checkers, and architecture decision records

Lecturer (fixed term)

Computer Science Department, University of Otago
January 2018 - November 2018

The Department of Computer Science is a small department composed of 14 full-time academic staff, six service staff, and three teaching fellows. In this position I lectured undergraduate courses on Effective Programming, Object-Oriented Programming and User Interfaces, Linux Network Management, and a post-graduate course on Advanced Databases.

Responsibilities

- Take lectures/tutorials conveying computer science concepts and provide appropriate assessment feedback to students from different academic and cultural backgrounds
- Complete administrative tasks in a timely, efficient manner in accordance with the University's policies
- Ensure relevant health and safety protocols are followed in all workplace activities

Achievements

Formal teaching evaluations were 'pretty outstanding [...] with a very good response rate'. All core teaching questions scored median values in the top two levels. The following are some of the comments students left on the evaluation forms anonymously

- I really enjoyed how open Paul was to answering questions. He was also very knowledgeable about the subject which is always helpful.
- Really good communicator, going to Paul's lectures always feels valuable and his verbal explanations help a lot with unpacking and understanding the concepts, really appreciate his depth of explanation in lectures and his patience and thoroughness when helping us in labs
- Paul has a great attitude about the topic and is obviously very passionate about it. I enjoy his teaching style and the way that he interacts with the students. He is also very helpful after class if you have any questions. He is very receptive to students who show enthusiasm on the topics and he meets them with a similar attitude. Having a teacher who is also engaged in the student's learning is rare and makes for a better learning environment.

Software Engineer
Downer Group
March 2017 - December 2017

The Downer Group is a company involved in civil infrastructure works across Australia and New Zealand. I designed, developed, tested, deployed and maintained a novel containerised digital signage application to push (in realtime) a wide range of relevant up-to-date content to remote display clients around the country while maintaining integrity and security of the data. Briefly, the application consisted of an AndroidThings client application; a message queue for control commands; a web application and associated database for administration of devices, content hosting, and data gathering and parsing (via asynchronous task queues); and, public key infrastructure to authenticate remote clients.

Achievements

- Reduced the number of tourist enquiries of a dozen businesses in Te Anau (population 2000) about the status of the only road to Milford Sound (a popular tourist destination), which is often closed at short notice due to avalanches and other hazards common in mountainous areas
- Increased visibility of earthquake recovery efforts by North Canterbury Transport Infrastructure Recovery (NCTIR), the organisation comprised of several government departments and private companies setup to recover from the magnitude 7.8 earthquake that struck Kaikōura in 2016

Education

PhD
Computer Science, University of Otago, 2017

An Indoor Localisation System Based on Ubiquitous Technology
<http://hdl.handle.net/10523/7564>

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 (Thesis Only) with Credit
Information Science, University of Otago, 2011

Beacon - A Rapidly Deployable Cellphone Network
<http://hdl.handle.net/10523/2267>

The thesis is an examination of the use of rapidly deployable cell-phone networks for disaster relief efforts. During a disaster, effective communications are vital to coordinate response efforts and to keep civilians informed. We propose and test a system that is aimed at use by civilians without the need for them to have any special equipment apart from a GSM mobile phone.

Postgraduate Diploma in Science, with Distinction
Telecommunications, University of Otago, 2010

Publications

Papers

- **P. Crane,** Z. Huang, H. Zhang, **CRAFT: Reducing the effort for Indoor Localisation** **<https://paul.crane.net.nz/publications/pimrc2017/pimrc2017.pdf>** *IEEE 28th Annual International Symposium on Person, Indoor and Mobile Radio Communications (PIMRC)* 2017, Montreal, Canada.
- **P. Crane,** Z. Huang, H. Zhang, **Emender: Signal filter for Trilateration Based Indoor Localisation** **<https://paul.crane.net.nz/publications/pimrc2016/pimrc2016.pdf>** *IEEE 27th Annual International Symposium on Person, Indoor and Mobile Radio Communications (PIMRC)* 2016, Valencia, Spain.
- **P. Crane,** Z. Huang, H. Zhang, **SIB: Noise Reduction in Fingerprint-based Indoor Localisation using Multiple Transmission Powers** **<https://paul.crane.net.nz/publications/mum2014/mum2014.pdf>** *Proceedings of the 13th International Conference on Mobile and Ubiquitous Multimedia* 2014, Melbourne, Australia.