Jesse Clark

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Eligible to work in Australia and in the United States.

Employment

University of Technology, Sydney, Ultimo, New South Wales November 2014 – Present
Senior Software Engineer
Responsible for software operations for a world-champion RoboCup@Home team. Established on-premises source control, automated testing, packaging, installation, launching, and diagnostics of robot applications, and trained team to use them.

Overhauled operations at The Innovation and Enterprise Research Lab to use modern source control, package management, and continuous integration. Organized the release of open-source software packages. Developed software for social robotics experiments. Presented research results at conferences.

Delivered lectures on iOS application development, digital forensics, SQL databases, neural networks, continuous integration, Docker containers, and web components. Developed curriculum and introduced automated evaluation of programming coursework. Mentored research students in fully-reproducible research methods. Mentored entrepreneurship students in rapid application development techniques.

Sydney Programming School, Mosman, New South Wales April 2015 – Present
Head of Teaching
Delivered programming lessons at an after-school program, as it grew from zero to over 1,000 students aged 8–13. This program has been well received and students can demonstrate new computational thinking skills. Developed curriculum for:

- Animation and Game Design with Scratch and Snap
- Computer Graphics with JavaScript
- Cryptography and Blockchain with Python
- Robotics with Arduino and Lego

Lesson plans are available for licensing.

Modus Ponens, LLC, Palo Alto, California
Self-owned Consulting Business
Founded a new business to develop web and mobile applications for Silicon Valley startups. Applied many cutting-edge technologies to deliver maximum value to clients. Led teams of local and remote designers and developers. Had contact with prominent venture capitalists.

NASA Ames Research Center, Moffett Field, California July 2007 – April 2011
Computer Scientist
Worked with the Human-Computer Interaction Research Group to develop innovative and highly dependable mission evaluation systems for the Space Shuttle, International Space Station, and Constellation programs. These systems were designed to enhance operator and astronaut safety and productivity. Acquired domain expertise and managed data-entry efforts to import legacy records. Implemented fulltext search, advanced relational search functionality, custom report formatting, and usability features for search interfaces. Deployed a continuous integration daemon. Established an automated testing framework.

NASA Goddard Space Flight Center, Greenbelt, Maryland June 2004 – June 2007
Computer Engineer
Developed robotics and graphics software to simulate contact dynamics for Hubble Space Telescope Servicing Mission 4. Used a FANUC industrial robot and a computer running a physics simulation to mimic the behavior of a Canadarm, which is too lightweight to operate normally in Earth gravity. Used capacative

sensors to guide robotic orientation, and summarized those sensors in a congressional design review. Recovered legacy climate data from the Nimbus and TIROS projects. Wrote Perl scripts to correct for degradation and translate to modern formats. Visualized results in Mathematica.

Wheels of Zeus, Los Gatos, California 2003
Wrote PIC assembly code and laid out a printed circuitboard for a Segway key duplicator.

Institute for Computer Assisted Orthopaedic Surgery, Pittsburgh, Pennsylvania May 2002 – July 2002
Intern
Designed and developed a graphical user interface for hospital patient database management and integration with in-house tools. In C and X-forms, developed a program to align x-rays with CT scans using a 6-dimensional BFGS search. Modified control hardware for use with computer systems in the operating room.

Refract Media, Los Gatos, California 1997 – 2000
Configured and maintained Linux servers for a web hosting company during the dot-com boom.

Open-Source Software Publications

Published explorable explanations and examples of best practices in several frameworks, for use in instructional materials. Published various small packages for file format conversion, terminal graphics, and text markup.

- Zodiac — Isomorphic web application engine using Backbone and Riak
- Dwarf Fortress Tileset Previewer
- REXPaint Web Viewer
- Factorio Server Control Panel
- Series Odds Calculator
- Proscrastinator's Clock
- Text Perpendicularizer
- Incremental — Tamper-resistant polynomial timer based on closed-form maths

Worked with the open-source community to discover areas for improvement in popular software packages, implement those improvements and automated tests to verify them, and publish the results. Notable contributions:

- **ROS** — Preeminent Robot Operating System
- **Docker** — Application container engine
- **Metalsmith** — Static website generator (used to generate this HTML/PDF document)
- **Gulp.js** — Streaming build system
- **Handlebars.js** — Declarative template engine
- **Dust.js** — Asynchronous template engine
- **Rivets.js** — Frontend data binding library
- **Bugzilla** — Widely-used bug tracking system
- **Audacity** — Cross-platform audio software

Academic Publications

1. Jesse Clark; Lenore Blum (2004): Reversible Cellular Automata on Infinite Configurations
   Presented at *Wolfram New Kind of Science 2004.*
2. Jesse Clark; Mary-Anne Williams: Building a Content Management System with Static Site Generation Technology
   In preparation for submission to the *ACM International Conference on Information and Knowledge Management*.
3. Xun Wang; Jesse Clark; Peter Gärdenfors; Mary-Anne Williams: Human Interpretation of Robot Pointing

In preparation for submission to the *Human-Robot Interaction Conference.*

4. Tonkin, Meg; Vitale, J.; Ojha, Suman; Clark, Jesse; Pfeiffer, Sammy; Judge, William; Wang, Xun; Williams, Mary (2017): Embodiment, Privacy and Social Robots: May I Remember You? Presented at International Conference on Social Robotics, Tsukuba, Japan
5. Herse, S.; Vitale, J.; Ebrahimian, D.; Tonkin, M.; Ojha, S.; Sidra, S.; Johnston, B.; Phillips, S.; Gudi, S. L. K. C.; Clark, J., *et al.* (2018): Bon Appetit! Robot Persuasion for Food Recommendation ACM/IEEE International Conference on Human-Robot Interaction
6. Vitale J, Tonkin M, Herse S, Ojha S, Clark J, Williams M, Wang X, Judge W (2018): Be More Transparent and Users Will Like You: A Robot Privacy and User Experience Design Experiment ACM/IEEE International Conference on Human-Robot Interaction

Education

Carnegie Mellon University, Pittsburgh, Pennsylvania May 2004
Bachelor of Science in Computer Science, Minor in Mathematical Sciences
(4-year degree with research component — Honours Equivalent)
Coursework in systems programming, artificial intelligence, machine learning, cryptography, computational linguistics, bioinformatics. Systems programming experience, including implementation of a TCP/IP network stack, context-switching kernel, memory manager. Major research project developed a genetic algorithm to solve constrained optimization problems in Mathematica.