

# 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 Researcher, Australian Research Council Discovery Project***

Work closely with the Discovery Project leaders to create and enhance the project outcomes. Contributed to several social robotics experiments and publications in preparation. Used industry expertise to enhance the research productivity of The Innovation and Enterprise Research Lab. Developed a novel content management system for data and publications. Organized the release of several significant open-source software packages, including several to the PR2 Research Community, which includes Stanford University, MIT, University of Tokyo, UC Berkeley, Carnegie Mellon University, Bosch, and Samsung. Interviewed research lab collaborators. Organized research hackathons.

Mentored PhD students in fully-reproducible research methods; Mentored undergraduates in the UTS:Hatchery Entrepreneurship Program. Gave lectures on continuous integration in the School of Software; I.T. for Entrepreneurs, and Paper Prototyping in the UTS:Hatchery Entrepreneurship Program. Worked with the Office of the Provost to develop curriculum for Bachelor of Creative Intelligence and Innovation electives. Member of the Scientific Visit to the University of Tokyo, Osaka University, and Sony — this visit has the purpose of developing new research collaborations.

**Sydney Programming School**, Mosman, New South Wales

April 2015 – Present

***Head of Teaching***

Taught Scratch and HTML to students aged 8–13 at an after-school program. Developed curriculum and automated evaluation. This program has been well received and students can demonstrate new critical programming skills.

**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. Notable clients include:

- **Maverick Poker** 2014  
Implemented a data and permissions model in Firebase for an online Poker game. Trained staff in iOS development.
- **OneLessDesk** 2014  
Built a message-queue-based tool for business process management.
- **Destination Software** 2013 – 2014  
***Principal Software Engineer***  
Developed a high-availability e-commerce web server for the travel and hospitality industry. Implemented automated deployment and zero-downtime updates of Node.js and Riak servers. Supported web-accessible map/reduce queries of combined domain data and analytics data. Trained new developers in MVC and Agile methodologies.
- **GoBoldly** 2013  
***Full-Stack Developer***  
Implemented a novel isomorphic web application engine that works even in javascript-disabled environments, and progressively enhances based on available functionality. Implemented an iOS frontend and Parse.com backend for a geo-social networking app.

- **Scanadu** 2012  
Developed an iPhone application to capture images of flu test strips and interpret the results.
- **SolarCity** 2012  
Developed a Node.JS web application to display live sales metrics. Developed a C# Service Stack web application to display customer locations on a map.
- **The Burn-Zone** 2011 – 2012  
Managed overseas developers to create a realtime sports discussion game.
- **Robot Panda Productions** 2011  
Developed authentication process, remote procedure call API, and database schema for a political Facebook game.
- **Soundwave** 2011  
Developed a prototype iPad music education app to present to investors.
- **Schmoooz** 2011  
Developed a Node.js backend and an iPhone frontend for a geolocation-based chat service.
- **wherU** 2011  
Developed an iPhone frontend for a college campus check-in service.
- **Gabberface** 2010  
Optimized network and database performance for a PHP/MySQL Facebook search engine. Improved site performance by 7x, resulting in over 25% more traffic.
- **WoWGen** 2008  
Deployed a Ruby on Rails site to track and compare World of Warcraft player statistics, and associated administration tools. Developed an interpreter for dynamic character equipment formulas extracted from game data files.

**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 capacitive 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.

Configured and maintained Linux servers for a web hosting company during the dot-com boom.

## Open-Source Software Publications

Published a novel isomorphic web application engine, **Zodiac**, which uses asynchronous Dust templates to stream dynamic Backbone views as they are being rendered, marked up with enough information to reinstantiate the same views on the frontend. Automatically routes models to declared endpoints. Communicates Riak metadata for automatic conflict detection and resolution.

Published examples of best practices in several web frameworks, for use in instructional materials. Published various small packages for format conversion, terminal graphics, and finite differences.

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 create this 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

## 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*.

## 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.