

# Jesse Clark

+61 459 763 305    1/35 Fairlight Crescent, Fairlight, NSW 2094    jesse@modusponens.org

Eligible to work in Australia and in the United States.

## Summary

Product developer and programming teacher

- Developed product prototypes used to secure funding for early-stage startups.
- Produced visualizations and automated reports to help find insights in data for space mission teams and B2C sales departments.
- Improved productivity and reliability of grant-funded research labs.

## Employment

**University of Technology, Sydney**, Ultimo, New South Wales

November 2014 – Present

### *Senior Software Engineer*

Responsible for software operations for a winning 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, SQL databases, neural networks, continuous integration, Docker containers, and web components. Developed curriculum and 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*

Taught programming at an after-school program, as it grew from 0 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. 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**  
*Head of Product Development*  
 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.

2013 – 2014
- **GoBoldly**  
*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.

2013
- **Scanadu**  
 Developed an iPhone application to capture images of flu test strips and interpret the results.

2012
- **SolarCity**  
 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.

2012
- **The Burn-Zone**  
 Managed overseas developers to create a realtime sports discussion game.

2011 – 2012
- **Robot Panda Productions**  
 Developed authentication process, remote procedure call API, and database schema for a political Facebook game.

2011
- **Soundwave**  
 Developed a prototype iPad music education app to present to investors.

2011
- **Schmoooz**  
 Developed a Node.js backend and an iPhone frontend for a geolocation-based chat service.

2011
- **wherU**  
 Developed an iPhone frontend for a college campus check-in service.

2011
- **Gabberface**  
 Optimized network and database performance for a PHP/MySQL Facebook search engine. Improved site performance by 7x, resulting in over 25% more traffic.

2010
- **WoWGen**  
 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.

2008

■ **NASA Ames Research Center**, Moffett Field, California  
*Computer Scientist*

July 2007 – April 2011

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  
*Computer Engineer*

June 2004 – June 2007

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.

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**
- **Procrastinator'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 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
- **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.