



Sunjay Varma

 sunjay.ca

 [sunjay03](https://twitter.com/sunjay03)

 github.com/sunjay

 varma.sunjay@gmail.com

 linkedin.com/in/sunjayv

Proven, exceptional skills refined by over 10 years of experience writing high quality software

Work Experience

Rust Research Software Engineer - rust-lang.org

Mozilla, San Francisco, CA, May 2018 - July 2018

- Participated in the rewriting of the Rust programming language trait solver using logic programming
- Developed a comprehensive set of logical rules for modelling "coherence" (an important language property)
- Worked independently to integrate rules into Chalk, the custom-built solver created for the Rust language

Constraint Solver Research Assistant - plg.uwaterloo.ca

Programming Languages Group, Waterloo, ON, Sep 2018 - now

- Developing a fast, specialized solver for logical and numerical constraints (applying Gaussian elimination)
- Working on a project designed to make unit conversions machine-checkable and compile-time safe

Compilers Research Assistant - cforall.uwaterloo.ca

Programming Languages Group, Waterloo, ON, Sep 2017 - present

- Implementing a dynamically-sized, copy-on-write string type with its own internally managed string heap
- Solved key design problems to make the syntax of the string package as ergonomic as possible

Artificial Intelligence Research Assistant - chil.uwaterloo.ca

Computational Health Informatics Lab, Waterloo, ON, Sep 2016 - Sep 2017

- Applied Natural Language Processing (NLP) and Machine Learning (ML) techniques to rate the quality of online health articles
- Rapidly learned NLP and ML topics necessary to produce results without any prior background knowledge

Software Developer - konradgroup.com

Konrad Group, Toronto, ON, Jan - Dec 2016

- Led the planning and implementation of the entire frontend and backend for a project from start to finish

Lead Software Architect - janetingley.com/anyware

anyWare (University of Waterloo), Waterloo, ON, May - Aug 2015

- Led a small team in the design and development of the entire software architecture for orchestrating several robotic sculptures with high volumes of input

Intermediate Software Developer Co-op - smartamp.com SMART Technologies, Calgary, AB, Sep - Dec 2014

Software Developer Co-op - smartamp.com SMART Technologies, Calgary, AB, Jan - Apr 2014

Full-stack Developer Part-time - clinicsense.com Clinic Sense, Toronto, ON, Jul 2013 - Oct 2014

Speaking Engagements

Writing Crates for Complete Beginners

(A Tour of Turtle) - RustConf 2018

Sep 2018 - youtu.be/ZtER1Wllbeo

Coherence in Chalk - Bay Area Rust Meetup

Jul 2018 - youtu.be/rZqS4bLPL24

An Introduction to Rust - Rust KW Meetup

Mar 2018 - youtu.be/bG-qnPj-AeY

RustBridge Waterloo 2018

Mar 2018 - rustbridge.github.io

How Rust Makes Advanced Type Systems

Accessible to the Masses - StarCon 2018

Jan 2018 - youtu.be/P0L3gnO-3IM

Education

Bachelor of Software Engineering (Candidate), Co-op, University of Waterloo May 2017 - present
Computer Engineering, Co-op, University of Waterloo Sep 2013 - Aug 2016

Open Source Work & Personal Software Projects

Teaching Programming to Complete Beginners - Turtle Graphics in Rust - turtle.rs

Graphics library for the Rust programming language with a simple and straightforward graphics model

- Writing a course to teach programming (in Rust) to people with no prior experience
- Designed a fully featured graphics library with a simple, well documented, and easy to learn API
- Refactoring the library internals to work in WebAssembly with no changes to the public interface
- Fostering a community of contributors and learners who help with bugs and add example programs

Rust Programming Language Compiler - github.com/rust-lang/rust

Rust is a systems programming language that runs blazingly fast, prevents segfaults, and guarantees thread safety

- Mentored by Niko Matsakis (Rust Core Team) on the implementation of RFC 1598 Generic Associated Types
- Extended the parser to support the necessary syntax for generic associated types
- Updated name resolution and lifetime resolution code to support generics in associated types

Lion (Unit Conversion Runtime) - github.com/sunjay/lion

A programming language and interactive REPL for automatically checking and performing calculations involving units

- Carefully designed language so that it could be completed in two phases: interpreter, then compiler
- Created an ergonomic way to specify units and conversions, even capable of finding indirect conversions
- Designed a process that uses mathematical laws to infer the units of complex expressions

Fast Sudoku Solver - github.com/sunjay/sudoku

Very fast Sudoku solving algorithm implemented in C, and then **dramatically** sped up with a rewrite in Rust

- Optimized representation of Sudoku board to avoid excess computation and maximize solving speed
- Created several reliable benchmarks to measure changes and ensure that performance does not degrade
- In a set of 21,885 puzzles of varying difficulty, 85% were completed in less than 10 ms, 80% were completed in less than 5 ms, and 60% were completed in less than 1 ms

Robo Quest - github.com/sunjay/robo-quest

Game written in Rust targeting the GameShell, a small handheld GameBoy-sized Linux computer

- Writing a game in Rust using SDL2 for rendering and the specs ECS for state management
- Integrated sprite animations and physics engine into ECS, with Tiled Editor for level maps
- Used Docker to reliably cross-compile to ARMv7 for the GameShell

For even more projects: github.com/sunjay

For my writings on various technical topics: sunjay.ca

University of Waterloo
Co-operative Work Terms

Sunjay Varma
20542381

3B Software Engineering, Honours, Co-operative Program

Work Term	Employer	Evaluation
Jan - Apr 2014	SMART Technologies ULC Calgary AB Software Developer Intern	OUTSTANDING
Sep - Dec 2014	SMART Technologies ULC Calgary AB Software Developer Intern	OUTSTANDING
May - Aug 2015	University of Waterloo Faculty of Arts Kitchener Research Assistant - Software Developer	OUTSTANDING
Jan - Apr 2016	Konrad Group Inc. Toronto Software Developer	OUTSTANDING
May - Aug 2018	Mozilla Corporation Divisional Office 1 San Francisco California United States Rust Research Engineering	OUTSTANDING

Planned Future Work Term(s)

Jan - Apr 2019
Sep - Dec 2019

Disclaimer: This evaluation does not constitute an employment endorsement or recommendation. Employer evaluations of student contributions and achievements during the work term are conducted as part of the University of Waterloo's Co-operative (Co-op) Education model. Like academic grades, overall evaluations are part of the assessment of a student's progress in the co-op portion of their degree studies. These assessments are completed using criteria set out by the University, not the employer, and do not reflect the employer's criteria or assessment metrics.