

Rudi Chen

CONTACT

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LINKS

Website : digitalfreepen.com
Github: github.com/rudi-c
Quora: [quora.com/Rudi-Chen](https://www.quora.com/Rudi-Chen)

EDUCATION

UNIVERSITY OF WATERLOO
BACHELOR IN COMPUTER SCIENCE
2012-2017
Average: 93%

SKILLS

LANGUAGES

Most experienced with:
C# • C++11 • Python • OCaml
Varying degrees of experience with:
Java • Rust • F# • Scala • C
Objective-C/Swift • Scheme/Racket
Javascript/Typescript • R • Ruby

TECHNOLOGIES

Tools:
Git • Vim • Sublime
Web:
React • Redux • D3 • Ruby on Rails
Play Framework • Elasticsearch • SQL
Spark • Hadoop
Desktop & Mobile:
Windows Store • Windows Phone
WPF • XNA • iOS
Graphics/GPU:
DirectX • OpenGL • CUDA • WebGL

EXPERIENCE

AIRBNB | SOFTWARE ENGINEERING INTERN

September 2016 - December 2016 | San Francisco, CA, USA

- Got ramped up quickly with React, Ruby on Rails and Java backend services and made numerous contributions outside my main projects.
- Refactored a fully-frontend complex employee dashboard to use backend pagination to reduce loading times.
- Redesigned an Elasticsearch service to use Kafka messages to easily change configuration with no downtimes and automatically recover the entire search index from crashes.

JANE STREET CAPITAL | SOFTWARE DEVELOPER INTERN

May 2016 - August 2016 | New York, NY, USA

- Became productive quickly in an environment with unique tools, a new language (OCaml) and very high code quality standards.
- Rewrote large parts of a system to use a functional-style transaction log to create a persistent state machine that can have multiple replica servers.
- Created a new system to monitor market events with a web UI built with Jane Street's Incr(emental) Dom library, a reactive style to UI programming and an OCaml-to-Javascript compiler.

DROPBOX | SOFTWARE ENGINEERING INTERN

May 2015 - August 2015 | San Francisco, CA, USA

- Contributed to Pyston, an open-source Python JIT compiler (see Github).
- Implemented finalizer support for garbage collection solving intricate edge cases such as object resurrection and optimized performance.
- Designed and started preliminary work on a conservative moving garbage collector.
- Wrote support for NumPy and improved CPython compatibility.

DROPBOX | SOFTWARE ENGINEERING INTERN

August 2014 - December 2014 | San Francisco, CA, USA

- Worked on the Carousel iOS app using a mixed Objective-C/C++ cross-platform development approach.
- Shipped Carousel for iPad, made progressive high-resolution thumbnail fetching, improved grid layout to reduce whitespace.
- Made a complex refactor of a major part of the thumbnail layout engine.
- Took the initiative to write the first Swift code.

SIDE EFFECTS SOFTWARE | 3D SOFTWARE DEVELOPER INTERN

May 2013 - Aug 2013 | Toronto, ON, Canada

- Designed a content-aware selection-zoom algorithm to navigate 3D scenes, an update manager for digital assets, and a framework to gather telemetry data and crash logs, and others features in a codebase of 10 millions of C++ lines.
- Implemented a framework that uses the Leap Motion Controller for 3D input as a project of my own initiative.

RESEARCH

JAVASCRIPT VIRTUAL MACHINES

January 2017 – April 2017 | University of Waterloo

- Wrote major optimizations to a Javascript runtime-contract systems implemented on the Higgs just-in-time compiler. Contributed to writing the paper.

COMPUTATIONAL MATHEMATICS

January 2016 – April 2016 | University of Waterloo

- Implemented fourier-based option pricing with jump diffusion on the GPU using CUDA.

HUMAN-COMPUTER INTERACTION

May 2014 – August 2014 | University of Waterloo

- Wrote apps for a 5 meter touchscreen, studying localized crowdsourcing.

COMPUTATIONAL PHOTOGRAPHY

Jan 2014 – April 2014 | University of Waterloo

- Used machine learning to create efficient heuristics for autofocusing with 98.5% success rate.
- With minimal supervision, read papers, wrote code (Python scripts), performed experiments and wrote the entire paper.

COSMOLOGY

May 2011 – August 2012 | McGill University

- Introduced, researched and implemented a solution for finding straight lines in extremely noisy images in C. Optimized sections of the program with a speedup factor of 30.

PUBLICATIONS

- [1] Rudi Chen and Peter van Beek, *Improving the accuracy and low-light performance of contrast-based autofocus using supervised machine learning.*
- [2] Hashmin Mir, Peter Xu, Rudi Chen, and Peter Van Beek, *An autofocus heuristic for digital cameras based on supervised machine learning.*

AWARDS

- 2016 2nd place in CS 488 for best graphics project
- 2014 2nd place in CS 241 compiler optimization contest, using graduate-level optimization techniques
- 2014 NSERC research award, 4500\$
- 2014 Winston and Diana Cherry Award for highest grade in a 4th year statistics class (that I took while in 2nd year)
- 2013 Mathematics Senate Scholarship for Academic Excellence, 3000\$
- 2012 Senior Eastern Canada Winner at the CCC (Canadian Computing Competition)

PROJECTS

FACESTATS | 2016

Data visualization of Facebook chat data, built with Typescript, React, Redux and D3.js

GPU VOLUMETRIC TERRAIN | 2016

Real-time volumetric terrain generation using marching cubes algorithm, all implemented on the GPU with OpenGL.

SKINWISE | 2014

Highly optimized fuzzy search (hybrid of a trie and Darmeau-Levenshtein with a lot of heuristics) and auto-completion engine in Scala/Play Framework.

INKING THE NORTH | 2014

App for note-taking with a stylus, with advanced features such as generating beautiful graphs from vague sketches, handwriting autocorrection, easy to use gestures for text insertion and deletion.

SMART RESIZE | 2013

Won first place at an international hackathon in Sweden. Presented at Nokia World '13, Abu Dhabi to journalists worldwide. Mentioned by Nokia CEO during Mobile World Congress '14 keynote. 100,000+ downloads on Windows Phone Store.

FRACTAL PHOTOGRAPHER | 2013-2015

Highly polished and optimized multi-threaded fractal renderer. Featured app on Windows Store (May '13), "Leap Motion with Windows" video, Techradar's "25 best Windows 8 apps available today", Intel App Innovation Contest. 50,000+ downloads on Windows Store.

INFLUENCE GAME | 2012

Independent artificial neural network research project with a virtual environment for AI teams to compete in and a variation of Swiss tournament which led to significant improvements to the AI, all documented on my website.

HARMONICS TD | 2009

Music-themed tower defense game that won first place in HBGames.org's indie game contest. Designed all of concept, levels, graphics, architecture and code.