

# Sheng (Johnson) Zhong

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## EDUCATION

**University of Toronto**

2013 - Present

Engineering Science (Robotics specialization) class of 2017

GPA: 3.87/4.0

## SKILLS

- **Programming** | C++ | Python | C | Lisp | Git | SVN | Mercurial
- **Web development** | Django | HTML | CSS | Jekyll | Javascript
- **Visual Design** | Inkscape | Photoshop | SolidWorks

## EXPERIENCE

### FPGA CAD Routing Optimization

Aug 2015

Summer research – more at [johnsonzhong.me/projects/vpr](http://johnsonzhong.me/projects/vpr)

- Routing component of VPR under the Verilog-to-routing toolchain
- Developed route tree pruning algorithm to enable incremental rerouting, resulting in up to **3x speedup** on difficult benchmarks
- Developed targeted rerouting algorithm for critical yet suboptimal connections, resulting in up to **30% faster (Fmax) circuits** produced
- Benchmarked over realistic circuits, with speedup scaling positively with difficulty

### Autonomous Interacting Robot

Apr 2015

Team of three – more at [johnsonzhong.me/projects/robot](http://johnsonzhong.me/projects/robot)

- Interacting mobile robots playing connect-4 on a randomized gamefield
- Targeted randomly placed high-reward ball dispensers to obtain the fastest ball retrieval time (3 vs average 0.5 ball/min)
- Designed and programmed subsumption architecture, stack-based targeting, and obstacle avoidance behaviour on Arduino microcontroller

### SAL - Algorithms and Data structures library

Jan 2015

Solo – more at [johnsonzhong.me/sal/](http://johnsonzhong.me/sal/)

- Header only C++ template library with an interactive tester
- Implemented efficient algorithms with a focus on generality and readability
- Implemented Set and Map with Treaps for 4x insertion and 2x read time improvement over the standard library

### Language Interpreter (Lisp)

Aug 2014

Solo – more at [johnsonzhong.me/projects/clisp](http://johnsonzhong.me/projects/clisp)

- Small and fast at around 550 lines of C++
- Implemented lexical scoping, first class functions, and tail recursion optimization
- Automated garbage collection with RAI

### IEEEExtreme Programming Contest

Oct 2013 | 2014

Team of three – Virtual Vagrants [placement](#)

- Solved algorithm-related programming challenges within 24 hours
- Placed **43/7500** (6<sup>th</sup> in Canada) in 7.0 | **52/unknown** (8<sup>th</sup> in Canada) in 8.0

## INTERESTS

| Robotics localization and navigation | Algorithms | Chess | Wushu |