Sydney Marie Gibson

https://sydgibs.com | gibsons@mit.edu

EDUCATION

MIT
MEng Candidate in Computer Science
June 2020 | Cambridge, MA

MIT
BA in Computer Science & Computer Engineering
June 2019 | Cambridge, MA
| GPA: 4.9/5.0

LINKS

LinkedIn — sydgibs
GitHub — sydgibs

TEACHING

TEACHING ASSISTANT
Artificial Intelligence | Fall 2019

LAB ASSISTANT
Fundamentals of Programming
| Spring 2019

SELECTED COURSES

GRADUATE
Principles of Computer Systems
Computer and Network Security
Computer Systems Security
Formal Reasoning about Programs
Operating Systems
Theory of Computation

UNDERGRADUATE
Computer Language Engineering
Computer System Engineering
Computation Structures
Software Construction
Artificial Intelligence
Algorithms

SKILLS

Verification Coq | FStar |Dafny
Functional Haskell | Ocaml | F#
Scripting Python | Bash | Perl
General C/C++ | Java | Go | C#
Tools Git | GDB | Emacs | Vim | LaTeX

INTERNSHIPS

MICROSOFT RESEARCH | Research Intern
June 2019 – September 2019 | Redmond, WA

- Designed a heap model using separation logic to achieve 25% reduction in SMT query times for Vale, Project Everest's cryptographic assembly verification tool.
- Project Everest is an effort to formally verify the HTTPS ecosystem, see: https://project-everest.github.io

VMWARE, INC. | NSX Controller Team Intern
June 2018 – September 2018 | Palo Alto, CA

- Added support for connection multiplexing to an internal fork of GRPC, optimizing resource consumption for sparse loads.
- Developed an extensible tool for querying hypervisor service state; given RPC stubs, the tool generates client calls and CLI methods to report the data.

AKAMAI TECHNOLOGIES | Network Team Intern
June 2017 – September 2017 | Cambridge, MA

- Designed an automated tool to map network topologies by polling live network switches for data.
- Improved forecasting algorithms for network utility and demand projections; built and deployed a corresponding web tool.

RESEARCH & PROJECTS

GOOSE VALIDATOR January 2019 – Present
Senior Research Project with MIT's Parallel and Distributed OS Group
A semantically-meaningful reification library and interpreter for `goose`, a tool for converting Go programs into a concurrent system verification framework for Coq.

ATLAS SECURITY AUDIT February 2019 – May 2019
Computer and Network Security Project | Voted Best Presentation
Audit of `atlas.mit.edu`, a general portal for MIT. Discovered an XSS attack using JavaScript-embedded SVG images for user profiles, and demonstrated an identity-masking worm using cheating quines.

OPTIMIZING COMPILER IN HASKELL February 2019 – May 2019
Computer Language Engineering Project
A compiler in Haskell for a toy language based on C. Compiler included register allocation and a Hoopl-inspired CFG-rewriting framework for optimizations.

BANACH-TARSKI VISUALIZATION May 2018 - June 2018
Web Applet for MIT's Paradox and Infinity Course
A visualization of the Cayley graph of a free group, embedded in a sphere. Used by Agustin Rayo to explain the Banach-Tarski paradox in his course, Paradox and Infinity.

ELECTROSTATIC PLAYGROUND BACKEND January 2017 - May 2017
Undergraduate Research with MIT Media Lab: Fluid Interfaces Group
Unity physics engine augmentations including a 4th order Runge-Kutta solver for accurate E&M particle interactions for an educational virtual reality game.

NANOPHOTONICS SIMULATION June 2016 - September 2016
Undergraduate Research with MIT's Modern Electro-Magnetics Group
Simulations of new wavefront-shaping techniques to find instantaneous full-transmissions solutions for beam propagation through random media.