Gabriel Brown

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EDUCATION

Columbia University – New York, NY
Bachelor of Arts, Computer Science, Concentration in Mathematics, May 2020
GPA: 3.8/4.0
Honors: Dean's List (Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018, Fall 2019)

Recurse Center – New York, NY
Self-directed programming retreat, Summer 2020

Lakeside High School – Seattle, WA
May 2016

EXPERIENCE

Back Technologies Gmbh, Backend Software Engineer — *December 2020 - Present*
As a backend software engineer at Back Technologies, I built APIs and integrations using **Go, Postgres, Redis, Protobuf, and GraphQL**. As one of three backend engineers at a pre-series A startup, I wore many hats and was responsible for developing new features, testing and QA, incidence response, and DevOps.

- Experience in Agile software development in a fast-paced professional environment

Columbia Internet Real-Time Lab, Software Engineer — *August 2019 - May 2020*
As a researcher at the IRT Lab, I worked on a project to improve Internet of Things (IoT) security in the wake of the Mirai botnet. My major contribution was writing software, running on a DD-WRT router, to automate IoT firewalling using IPTables. I also developed a test tool using Scapy to imitate the behavior of a compromised IoT device. My code and a full summary of my work is available at github.com/GabeIB/IoT-Security-MUDfile-to-IPTables

- Used MongoDB, iptables, packet sniffing, packet forgery, and DNS spoofing

General Antiparticle Spectrometer Lab (GAPS), Software Engineer — *January 2017 - May 2018*
GAPS is a project focused on identifying antiparticle energy signatures that are useful to understanding the nature of dark matter. I worked as a lab technician, writing software for internal tooling.

- Improved legacy C code for manufacturing of x-ray detectors, **increasing production by 50%**

PROJECTS

Additive Synthesizer VST – github.com/GabeIB/additive_synth
During my time at Recurse Center, I built a real-time additive synthesizer in C++ using the JUCE framework. The synthesizer features per-partial amplitude envelopes and a python interface for computational sound design.

- Proficiency working within a large C++ codebase
- Proficiency developing interactive GUI applications with JUCE

Message Board Application Backend – github.com/GabeIB/message-board-backend
As a personal project, I built the backend for a message board application using Go, PostgreSQL, and Docker that exposed a RESTful API. I deployed the application using AWS Elastic Beanstalk.

- Experience building, testing, and deploying backend applications with Go, Postgres, Docker, and AWS

MiniC to YUL Transpiler – github.com/GabeIB/YUL-transpiler
Under the direction of Vilhelm Sjöberg, I wrote a MiniC to YUL transpiler in OCaml that will form the basis of YUL language support for the DeepSEA compiler. DeepSea is a language developed by CertiK for generating formally verified smart-contracts for the Ethereum blockchain. Because of this contribution, I am listed as a co-author for the DeepSEA Compiler.

Windows X86 Shellcode – gabrielbrown.net/blog/shellcode3/
As a personal project, I wrote a payload in x86 assembly that would spawn a reverse shell to a command and control server listening on an arbitrary port and IP address.

- Proficiency in disassembly and assembly analysis using IDA, Ollydbg, and WinDbg

SKILLS

Programming Languages: Go, Python, C, C++, Java, Go, x86 Assembly
Tools: Postgres, GraphQL, Protobuf, MongoDB, JUCE, Bash, IDA, Ollydbg, Wireshark, IPTables,OpenGL