Andrew **Burford**

203-707-0801 | andrewsburford@gmail.com | aburford.github.io
github.com/aburford | linkedin.com/in/andrew-burford

Education

Stony Brook University — *Stony Brook, NY*

B.S. in Computer Science | GPA: 4.0 — *Aug. 2018 - Dec. 2021*

B.S. in Applied Mathematics and Statistics | GPA: 4.0 — *Aug. 2018 - Dec. 2021*

M.S. in Computer Science *(In Progress)* — *Jan. 2022 - Dec. 2022*

Skills

Programming	*Experience*	**Systems**	*Experience*	**Libraries**	*Experience*
Python	*3 yrs*	Linux	*3 yrs*	NumPy	*7 mos*
Java	*2 yrs*	Bash	*3 yrs*	Matplotlib	*7 mos*
C/C++	*1 yr*	Git	*3 yrs*	Rails	*6 mos*
Javascript	*10 mos*	LLVM	*4 mos*	Phaser	*6 mos*
Ruby	*6 mos*	MIPS	*4 mos*	PyTorch	*4 mos*
R	*4 mos*	MongoDB	*4 mos*	Node.js	*4 mos*
Swift	*2 mos*	SQL	*3 mos*	React	*4 mos*

Experience

Stony Brook University — *Stony Brook, NY*

Research Assistant | File systems and Storage Lab — *May 2021 - PRESENT*

- Assist with incorporating machine learning into Linux kernel for purpose of tuning operating system parameters
- Debug and benchmark multiple machine learning methods applied to optimization of disk cache configuration
- Modify and extend kernel module code and system call hooks inserted into modified Linux kernel
- Build upon Re-Animator LTTng C++ software to parse and statistically analyze system call trace data
- Write user documentation and help co-author manuscript for publication

High Performance Computing Engineer | Computing Center — *Feb. 2019 - May 2021*

- Performed software environment maintenance for 200+ packages and libraries in wide range of languages
- Compiled, optimized, and profiled new software across variety of hardware architectures
- Resolved customer service tickets by troubleshooting system issues on high performance computing cluster

Milestone C — *Woodbridge, CT*

Software Engineer / Course Designer — *May - Aug. 2020, May - Aug. 2021*

- Designed and developed educational games in Javascript for high school students to learn STEM subjects
- Formulated lesson plans, slideshows, and practice problems for capstone programming course
- Created example Raspberry Pi projects teaching students to create Internet-of-Things devices using Node.js, WebSockets, Redis, Bluetooth, and Python

AdSpaceUSA — *West Haven, CT*

Software Development Intern — *Jun. 2018 - Aug. 2018*

- Developed data scraping programs in Python to collate contact information from websites, PDF's, and images
- Designed and implemented data cleaning and interpolation scripts to match and merge 1000+ contact details

Amity Regional High School Technology Department — *Woodbridge, CT*

Volunteer Full-stack Web Developer — *Jun. 2017 - May 2018*

- Managed high school's internal websites and refactored backend server from PHP to Ruby on Rails

Projects

Neural Network Verification Research Paper

Individual Graduate Class Project — *Sep. 2021 - Dec. 2021*

- Researched neural network verification techniques e.g. ExactReach, Reluplex, MaxSens
- Extended Neurify verification software to support sigmoid activation function and benchmarked performance
- Communicated findings to professor and class via presentation and paper

DiemBFT Implementation

Group Graduate Class Project — *Sep. 2021 - Dec. 2021*

- Implemented DiemBFT distributed consensus protocol in Python to create Proof of Concept blockchain
- Integrated Twins testing approach for Byzantine Fault Tolerant systems to prove safety and liveness

U.S. Congressional Redistricting Explorer

Group Undergraduate Class Project — *Jan. 2021 - May 2021*

- Developed Python scripts to generate random districting plans using geospatial data and graph algorithms
- Assisted with frontend Javascript to filter and view districtings using Leaflet, Bootstrap, and jQuery
- Designed and helped implement Java backend performing statistical analyses on 10+ GB of districting data

Bluetooth Beacon Attendance System

High School Senior Capstone Project — *May 2018 - Jun. 2018*

- Engineered cryptographically secure solution for students to mark attendance in class via iOS devices
- Wrote Ruby on Rails backend, iOS application in Swift, and Raspberry Pi bash script to create Bluetooth Beacon

Run Logger (iOS Application)

Solo Passion Project — *2016 - 2017*

- Independently designed and developed iOS application published on iOS App Store
- Allowed runners to easily track and record runs directly from iPhone, iPad, or Apple Watch

Extracurricular Activities

Stony Brook Running Club — *Stony Brook, NY*

President — *Aug. 2020 - May 2021*

Secretary — *Aug. 2019 - May 2020*

- Led daily practices and workouts as well as weekly meetings with executive board members
- Communicated club news and information, managed sign up roster for meets, and kept club website up to date
- Fostered welcoming environment by guiding members on new routes and providing training advice

Stony Brook Competitive Programming Club — *Stony Brook, NY*

Team Competitor — *Sep 2019 - PRESENT*

- Utilize advanced data structures and complex algorithms beyond what is taught in undergraduate classes
- Collaborate with two teammates for weekly 5-hour practice contests and official competitions
- Compete on Stony Brook's top team at Greater New York Regional Programming Contest two years in a row
- Present explanations of solutions and give formal presentations about general programming techniques

Honors & Awards

2021	**3rd out of 55 teams**, Greater New York ICPC Regional Programming Contest	*Online*
2021	**4th Individual**, NIRCA Cross Country Northeast Regional	*Attleboro, MA*
2020	**1st Place Senior Category**, Stony Brook Competitive Programming Contest	*Stony Brook, NY*
2019	**2nd Place Junior Category**, Stony Brook Competitive Programming Contest	*Stony Brook, NY*
2019	**12th out of 65 teams**, Greater New York ICPC Regional Programming Contest	*Newark, NJ*
2018	**Eagle Scout**, Boy Scout Troop 63	*Woodbridge, CT*