

Andrew Burford

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Education

Stony Brook University

B.S. IN COMPUTER SCIENCE | GPA: 4.0

B.S. IN APPLIED MATHEMATICS AND STATISTICS | GPA: 4.0

M.S. IN COMPUTER SCIENCE | GPA: 4.0 (In Progress)

Stony Brook, NY

Aug. 2018 - Dec. 2021

Aug. 2018 - Dec. 2021

Jan. 2022 - Dec. 2022

Skills

Programming	Experience	Systems	Experience	Libraries	Experience
Python	3.5 yrs	Linux	3.5 yrs	Matplotlib	1 yr
Java	2 yrs	Bash	3.5 yrs	NumPy	8 mos
C/C++	1.5 yrs	Git	3.5 yrs	Rails	6 mos
Javascript	10 mos	Elasticsearch	4 mos	Phaser	6 mos
Ruby	6 mos	MIPS Assembly	4 mos	PyTorch	4 mos
R	4 mos	MongoDB	4 mos	Node.js	4 mos

Experience

Stellar Cyber

SECURITY ENGINEER INTERN

Santa Clara, CA

Jun. - Aug. 2022

- Analyzed statistical models and modified parameters to improve reliability of anomalous data detection
- Utilized penetration testing tools and wrote scripts to trigger alerts on OpenXDR cybersecurity platform
- Designed and developed automation framework in Python for running my scripts in preconfigured environments

Stony Brook University

RESEARCH ASSISTANT | FILE SYSTEMS AND STORAGE LAB

Stony Brook, NY

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

SOFTWARE ENGINEER / COURSE DESIGNER

Woodbridge, CT

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

SOFTWARE DEVELOPMENT INTERN

West Haven, CT

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

Projects

Implementation of Space Optimal Suffix Array Query Algorithm

GROUP GRADUATE CLASS PROJECT

Jan. 2022 - May 2022

- Wrote standalone C implementation of a suffix array query algorithm based on BWT compression
- Demonstrated superior performance against uncompressed query time in memory constrained environments
- Combined our algorithm with FM-Index to demonstrate use case of locating substring occurrences in DNA data
- Communicated findings to professor and class via presentation

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

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

2022	Provost's Award for Academic Excellence , Stony Brook University	Stony Brook, NY
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	12th out of 65 teams , Greater New York ICPC Regional Programming Contest	Newark, NJ
2018	Eagle Scout , Boy Scout Troop 63	Woodbridge, CT