Andrew **Burford**

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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 | GPA: 4.0 *(In Progress)*   *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   *Santa Clara, CA*
SECURITY ENGINEER INTERN   *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
- Developed automation framework for running such scripts in preconfigured environments

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

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 occurences 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*