SAMUEL XIFARAS

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Andover, MA

EDUCATION

Khoury College of Computer Sciences, Northeastern University — Boston, MA
Candidate for MS in Computer Science — *September 2022 – Present*
GPA: 4.00/4.00
Relevant Coursework: Computer-Aided Reasoning; Compilers
Thesis Title: Leveraging Type Annotations for Effective Fuzzing of Python Programs
Thesis Advisor: Dr. Panagiotis Manolios

Khoury College of Computer Sciences, Northeastern University — Boston, MA
BS in Computer Science — *September 2018 – May 2022*
GPA: 3.92/4.00
Relevant Coursework: Graduate-level Computer Systems; Graduate-level Artificial Intelligence; Database Design; Theory of Computation; Networks and Distributed Systems; Object Oriented Design; Graduate-level Algorithms; Logic and Computation
Clubs and Organizations: Co-Founder of Oasis – NEU's Software Project Hub, Sandbox – NEU's Student-Run Software Consultancy
Honors and Awards: Khoury College Dean's List: Fall 2018, Spring 2019, Fall 2019, Fall 2020, Fall 2021, Spring 2022
Positions: Teaching Assistant for Object Oriented Design, Fall 2020

Phillips Academy Andover — Andover, MA
GPA: 5.43/6.00 — *September 2014 – June 2018*
Relevant Coursework: Data Mining, Machine Learning, Data Structures and Algorithms, Data Visualization, The Open Source Movement

SKILLS

Languages (Proficient): Python, JavaScript/TypeScript, Java, C#, HTML/CSS, C, Racket (Scheme), Common Lisp, SQL
Languages (Familiar): R, Julia, Swift, C++
Technologies and frameworks: Django, Flask, ReactJS, Elasticsearch/Opensearch, Docker, PostgreSQL, MongoDB, NumPy, Pandas, scikit-learn, NLTK (Natural Language Toolkit) for Python, Jupyter, ACL2, ACL2s, .NET, AngularJS, d3.js, MySQL, SQLite, LaTeX, SLURM, Terraform, uWSGI, gunicorn
Cloud services: AWS (EC2, S3, ECS, Route53, RDS, Managed Opensearch, SQS, SNS, Lambda), Datadog
Software and Version Control: Git, PyCharm, WebStorm, Eclipse, IntelliJ IDEA, Visual Studio, Bash, zsh, Microsoft Office

WORK EXPERIENCE

Paperless Parts — Boston, MA
Software Engineer I/II — *August 2021 – Present*

- Led design and development of an RFQ forwarding service which has become an integral part of customers' workflow–this service handles receipt of ∼**400 emails per day**, and the top 10 most active users of the service represent **$219k** of ARR for the business
- Contribute to a fast-paced scrum team across the full stack, touching **Django** backend, **ReactJS** frontend, and DevOps/CI in **Jenkins** and **AWS**
- Automate building of third-party dependencies from source with **Jenkins** pipelines
- Spearheaded a project to deep-dive into our search feature (based on **Opensearch**) and optimize its performance
- Maintain security standards and best practices for **FedRAMP Moderate compliance**
- Designed solution for orchestrating Canary deployments within our current infrastructure
- Implement latest FIPS encryption standards, required for compliance
- Regularly apply software patches and perform routine upgrades to resolve vulnerabilities in our software bill of materials (SBOM)
- Rigorously document knowledge for the benefit of the team and posterity
- Led a backend engineer Community of Practice for eight months, with a focus on tackling tech debt, standardizing development and testing best practices, and pushing for initiatives that improve developer experience
- Mentored two co-ops

Capital One — McLean, VA
Software Engineering Intern — *June 2021 – August 2021*

- Developed a regression test suite for the One-Time Payment service with **Java Spring** and **Cucumber**
- Saved developers **210 total man-hours** with each release, as testing the payment channels manually is time-intensive
- Worked with a pod of other interns in an Agile environment

Paperless Parts   Boston, MA
Software Engineering and DevOps Co-op   *January 2021 – May 2021*

- Implemented features to enhance workflows in the core product with **ReactJS** and **Django** across the full stack
- **Worked directly with a customer** to build an integration between the Paperless Parts platform and their ERP system

nference   Cambridge, MA
Data Science/Software Engineering Co-op   *September 2019 – August 2020*

- Led frontend development with **ReactJS** for a "Competitive Landscape" data mining tool for Janssen
- Collaborated independently with offshore API development team to coordinate on API contracts and expectations
- **Interfaced directly with Janssen clients** at monthly meetings to discuss progress and feature requests
- Developed **2** APIs–for storing image annotation data and retrieving financial market data–using **Python**, and **MongoDB**
- Produced biomedical data analyses and visualizations with **Pandas, scikit-learn, and R** for **2** Janssen client projects

RESEARCH EXPERIENCE

Khoury College of Computer Sciences, Northeastern University   Boston, MA
Master's Thesis   *January 2023 – November 2024*
Thesis Title: Leveraging Type Annotations for Effective Fuzzing of Python Programs
Thesis Advisor: Dr. Panagiotis Manolios
PDF Link: https://tinyurl.com/hua2eb5a
Synopsis:

My thesis, "Leveraging Type Annotations for Effective Fuzzing of Python Programs," was motivated by the poor state of static analysis tooling for Python. Tools available today emit many false positives, and my thesis advisor and I hypothesized that a hybrid static-dynamic approach would work better for a highly dynamic and duck-typed language like Python. I explored extracting Python type annotations and leveraging them to fuzz Python programs more holistically and intelligently. Then, I implemented a fuzzer based on this approach and performed a rigorous experimental evaluation on open-source Python repositories. We indeed found that this approach shows promise, and several bugs were identified and reported.

- Implemented fuzzing tool from scratch in **Python** with strong **object-oriented design** principles to facilitate rapid extension
- Developed infrastructure to orchestrate running of experiments and results collection on a SLURM-based HPC environment
- Evaluated on 15 open source repositories, and reported several real-world bugs that were discovered during evaluation
- **Dockerized** the application, in preparation for possible commercial deployment

Northeastern University   Boston, MA
Research Assistant   *January 2022 – May 2022*

- Worked with three Northeastern Professors on novel machine learning research on neural network "portfolios"
- Implemented a neural network portfolio, which is an ensemble of several neural networks
- Used open-source neural network verification tooling to implement mathematically guaranteed error bounds for the chosen application: a learned database index
- Developed infrastructure to run experiments and collect results

EXTRA-CURRICULAR SOCIETIES AND INTERESTS

Oasis, Northeastern's Software Project Hub   Boston, MA
Co-founder & Director   *June 2020 – January 2021*

- Co-founded Oasis with Will Stenzel, with the mission of making obtaining software project experience accessible to Khoury college undergraduates who are looking for their first co-op opportunity
- Oasis continues to be successful in our absence, and membership has grown significantly

Sons of Pericles   Lowell, MA
Treasurer   *Summer 2017 – Present*

- Manage finances for this fraternal organization which promotes philanthropy, civic responsiblity, and individual excellence

Interests: gardening, hiking, biking, tennis, electronic music production, investing, classical piano