Zainab Aamir

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EDUCATION

Stony Brook University, New York, USA *August 2021 - Present*
PhD in Computer Science, Advisor: Dr Dongyoon Lee - GPA: 3.7
Graduate Courses : Operating Systems, Compiler Design, Data Science, Computer Networks, Machine Learning

Lahore University of Management Sciences, Pakistan *August 2017 - May 2021*
BSc (Honours) in Computer Science - GPA: 3.5

EXPERIENCE

Stony Brook University August 2021 - Present
Graduate Research Assistant *Stony Brook, New York*

- Researching Regular Expression Denial of Service (ReDoS) security exploit, focusing on prevention mechanisms through redesigning regular expression engines
- Developed an automated pipeline to mine Pypi and npm ecosystems (240k packages), identify and dynamically validate over 400 vulnerable regexes
- Conducted interviews with authors of vulnerable regexes to compare and assess different repair strategies

Stony Brook University January 2022 - January 2023
Graduate Teaching Assistant *Stony Brook, New York*

- Fundamentals of Computer Networks (CSE 534) and System Fundamentals (CSE 220)
- Curated and graded major course components for over 100 students
- Conducted weekly office hours to help students understand advanced concepts and address specific issues

Grey Matter Global Consultancy January 2020 - May 2020
Application Developer *Lahore, Pakistan*

- Member of the software engineering team to develop a web portal for college counselling, following Agile methodology
- Designed front-end using ReactJS and employed ReduxJS for asynchronous state management
- Designed and hosted a real-time database on Google Firebase

PROJECTS

Linux Stackable File System

- Developed a Linux stackable file system on 'wrapfs' to mimic the secure recycling bin file system present in Windows and macOS
- Modified kernel source code to integrate the file system and allow asynchronous file operations
- Implemented multi-threaded operations enabling concurrent use by multiple users, each with distinct permissions

Web Page Rendering Enhancement for Bigger Screen Ecologies

- Developed a Unity based rendering engine to enhance webpages for large scale displays
- Identifying and extracting relevant DOM attributes of a webpage to scale and adjust their display locations for viewing on larger screen ecologies, tested on a 3x2 screen setup (5120 x 1440 - 48")

Encrypted Smartphone Network Traffic Analysis for Application Fingerprinting

- Performed a study on the feasibility of passive app identification by analyzing side-channel data of encrypted network traffic
- Implemented machine learning models utilizing scikit-learn and TensorFlow, trained on extracted app fingerprints and tested on a dataset of 413 Android and iOS applications

PUBLICATIONS

Hassan, **Aamir**, Lee, Davis, and Servant. *Improving Developers' Understanding of Regex Denial of Service Tools through Anti-Patterns and Fix Strategies.* Proceedings of the 44th IEEE Symposium on Security and Privacy **(IEEE S&P'23)**

LEADERSHIP, SERVICE AND AWARDS

- Member of the PhD Panel for incoming Graduate Students at Stony Brook University
- President of Graduate Women in Science and Engineering at Stony Brook University
- Member of the Artifact Evaluation Committee for the 24th ACM International Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES 2023)
- Awarded the ACM CCS Student Conference Grant
- Selected for Computing Research Association's Grad Cohort for Women in Computer Science
- Mentor at the Computer Science and Informatics Summer Research Experience (CSIRE) at Stony Brook University

TECHNICAL STRENGTHS

Programming Languages	Python, C, C++ Java, C#, Javascript
Tools, Frameworks	MySQL, Microsoft SQL,NoSQL MATLAB, Visual Studio, LaTeX