MUZAMMIL ABDUL REHMAN

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Los Angeles, CA

EDUCATION

Northeastern University – Boston, MA — September 2015 – August 2017
M.S. Computer Science — CGPA: 3.63

Lahore University of Management Sciences (LUMS) – Pakistan — August 2011 – June 2015
B.S Computer Science — CGPA: 3.72

WORK EXPERIENCE

EdgeCast/Verizon Digital Media Services — Los Angeles, CA — August 2018 – Present
Software Development Engineer — Traffic Engineering Team

- Researched and rearchitected a real-time network traffic analytics system to **decrease the response time by 47x**, **increased the load capacity by 30x** and **decreased storage footprint by 9x** using similar physical servers.
- Implemented a lock-free, horizontally and vertically scalable, datastream ingestor capable of transforming and ingesting **200,000 - 400,000 messages per thread per second** in Golang.
- Decreased memory footprint for a real-time ingest pipeline by **95%**.
- Architected, automated, and monitored the deployments of **ClickHouse** and **Elasticserach** clusters on bare-metal servers.
- Extended an internet measurements and health-checking system to implement new features in C++.
- Developed a **test suite** for unit, and integration testing, to increase the lifespan of the software in Python.
- Decreased the response time of a near real-time system by 30% by identifying the bottlenecks and reimplementing optimized versions of the code.
- Enhanced **monitoring** metrics and alerting tools for the CDN load-balancers and related subsystems.
- Provided Tier-2 and Tier-3 support to meet SLAs as one of the service owners for load-balancers, and traffic analytics systems of the CDN.

Northeastern University — Boston, MA — September 2015 – August 2018
Graduate Research Assistant — Networked Systems Research Group

- Developed an Internet router geolocation system which **outperforms state-of-the-art** methods by up to 15%.
- Leveraged **machine learning** classifiers with real-time measurements and Internet Registry records to predict locations of network routers with 96.5% accuracy.
- Achieved **scalability** and near **real-time response** by optimizing IP geolocations to use less than 10% of vantage points.
- Launched a **website** for geolocating Internet addresses using Python, Flask, Django ORM, MySQL and D3.js
- Deployed a public **REST API** at https://passport.ccs.neu.edu for users.
- Mentored undergraduates in principles of software development, web development and research.

PERSONAL PROJECTS

- Engineered a **CDN** system using Amazon EC2 servers with location and DNS-based rerouting, and LRU caching.
- Implemented a **TCP/IP Stack** using raw sockets with flow control and TCP Reno congestion control in Python.
- Built a multi-user **Distributed File Sharing System** with selectable consistency guarantees between reads and writes in C++.
- Created a fault-tolerant, scalable, available **Distributed Key-Value Store** to process millions of records in C++.
- Programmed a resilient, cache-enabled, hash-based **Distributed Password Cracker** to brute force passwords.
- Developed a **firewall** to perform stateful network inspection, and filter and identify malicious packets.
- Coded Chord algorithm in a **Distributed Hash Table** for balancing the storage of files shared between peers.

Additional Experience and Awards

Dean's Fellowship Award — Northeastern University
Awarded to admitted PhD students. — *2015 – 2016*

Dean's Honor List Award — LUMS
Awarded to students achieving academic excellence at LUMS. — *2011 – 2015*

Student Researcher — LUMS
Designed a system to secure cloud computing by eliminating sources of nondeterminism in VMs. — *2014 – 2015*

Teaching Assistant — LUMS
Teaching Assistant for a Graduate-level Computer Networks course. — *2014*

Coursework

- Advanced Algorithms
- Advanced Programming in Java
- Data Structures in C++
- Data Mining & Machine Learning
- Intensive Operating Systems
- Services Oriented Computing
- Software Engineering
- Topics in Distributed Systems
- Topics in Network Security

Programming and Development Skills

Languages: Python, Go, C++, C, JavaScript, Java, MySQL.
Others: Linux, Networking Protocols, Internet Measurements, Distributed Systems, Big Data Analysis, Timeseries/Realtime Analytics, ClickHouse, Elasticsearch, Kafka , Parallel Computing, Object Oriented Programming, System Development Life Cycle, Network Loadbalancing, Nginx, Vagrant.