Protick Bhowmick

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Experience

Summer Intern	**Cisco, San Francisco, California**	**May 2023 - August 2023**

- Collaborated with the ThousandEyes research team to build Endpoint event detection algorithm using Python and Apache Kafka, aiming to identify network outages in real time for diverse clients, including 180 Fortune 500 companies.
- Designed an algorithm for detecting Domain Name Resolution events and implemented in the existing pipeline. This algorithm significantly helped in accurately detecting DNS events, eliminating prior misattribution to VPNs and gateways.
- Analyzed network measurement data to establish data quality metrics using Presto and Apache Spark. Collaborated with the Engineering team to enhance and correct the data collection strategy.

Graduate Research Assistant	**Virginia Tech, Blacksburg, Virginia**	**Jan 2021 - Present**

- Conducting research in network security and measurement with an emphasis on public key infrastructure.
  - Performed a longitudinal measurement analysis on OCSP responders to establish that 13% of Certificate Authorities have unreliable OCSP infrastructure exposing a latent security vulnerability of web PKI (Python, Node.js, Apache Spark).
  - Improved the performance of Firefox's TLS handshake mechanism by fetching OCSP information over DNS using C++. This resulted in faster first content full paint for 31% of the top 1M Alexa domains.

Software Engineer	**Priyo Systems, Dhaka, Bangladesh**	**Jan 2020 - Dec 2020**

- Developed and designed Priyo, the largest news aggregator platform in Bangladesh using Python, Django rest framework, PostgreSQL, MongoDB and Celery.
- Implemented news recommendation system using collaborative filtering techniques utilizing Apache Spark increasing 7% average time spent on site.
- Created an interactive map utilizing Django and React to visualize the spread of COVID-19 in Bangladesh, used and registered by over 500,000 users throughout the pandemic.

Software Engineer	**iPay Systems, Dhaka, Bangladesh**	**Nov 2018 - Dec 2019**

- Designed payment modules in microservice architecture using industry-standard security practices using Java, Spring Boot, PostgreSQL, Kafka and RabbitMQ.
- Led the development of Bank gateway module that enabled instant money transfers with 12 banks in Bangladesh.

Education

Masters in Computer Science	**Jan 2021 - Dec 2023 (Expected)**

- **Virginia Tech**, Blacksburg, Virginia, USA

B.Sc. in Computer Science	**Apr 2014 - Oct 2018**

- **Bangladesh University of Engineering and Technology**, Dhaka, Bangladesh

Technical skills

- **Languages**: Python, Java, C++, C, JavaScript/HTML/CSS, SQL, Node.js
- **Technologies**: Django, Springboot, Apache Spark, PostgreSQL, JUnit, MongoDB, AWS, Docker, Redis, Selenium

Selected Projects and Publications

- **Revisiting the NXNS Attack** Measured security patches in DNS resolvers against NXNS attack in DNS resolvers around the world leveraging Luminati proxy network (Docker, EC2, Node.js, Python) [details]
- **Comparative analysis of CDN performance** Analyzed CDN usage among Tranco domain list and compared the CDNs with respect to different performance metrics (Python, socks5 proxy) [details]
- **Clustering of handwritten digits** Evaluated how agglomerative clustering performs on MNIST dataset; carried out poisoning and obfuscation attacks on single-linkage clustering exploiting the linkage criteria. (Python, scikit-learn) [details]
- **Measuring TTL Violation of DNS Resolvers at scale** (2022), Authors: **Protick Bhowmick**, Mohammad Ishtiaq Ashiq Khan, Casey Deccio, and Taejoong Chung (Published in Passive and Active Measurement Conference 2023)
- **A Comparative Analysis of Certificate Pinning in Android and iOS** (2022), Authors: Amogh Pradeep, Muhammad Talha Paracha, **Protick Bhowmick**, Ali Davanian, Abbas Razaghpanah, Taejoong Chung, Martina Lindorfer, Narseo Vallina-Rodriguez, Dave Levin, and David Choffnes (Published in Internet Measurement Conference 2022)