RAJVARDHAN SOMRAJ DESHMUKH

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EDUCATION

Master of Science, Electrical and Computer Engineering — Expected December 2018
University of Massachusetts, Amherst, MA | GPA: 3.71/4

Bachelor of Technology, Electronics and Communication Engineering — June 2016
Vellore Institute of Technology, Tamil Nadu, India | GPA: 8.53/10

COURSEWORK

Advanced System Software Design, Algorithms, Computer Networks, Wireless Sensor Networks, Trustworthy Computing, Web-development backend

COMPUTER SKILLS

Working Proficiency: Python, C/C++, Java, Android, sqlite, Django, NS3, TCP/IP, NDN, Mininet, SDN
Intermediate Knowledge: NFV, JavaScript, MATLAB, R, Docker

EXPERIENCE

Graduate Research Assistant: Computer Networks, University of Massachusetts Amherst — February 2017-Present

- **Improving QoE of ABR Streaming Sessions through QUIC Retransmissions (Python)**
  - Implemented an algorithm to analyze 3-day video streaming data from Akamai CDN to identify video-quality gaps that could be filled to improve QoE.
  - Amended and verified adaptive bit-rate streaming strategy SQUAD over QUIC, HTTP/1.1 and HTTP/2, on Cloudlab (testbed) nodes using Astream player (client application implemented in python) and Caddy server.
  - Implemented multiple stream requests over HTTP/2 and QUIC in the Astreamer using concurrent programming.
- **Scalable and low latency system for disseminating alerts in VANETS (C++, Python)**
  - Compared existing LTE-IP based approach to VANET-Information Centric Approach (ICN) (ndnSIM/ns-3).
  - Formulated and exhibited efficient geo-location based forwarding strategy, that sends alerts 100 times faster than LTE based approach, for 63% of total messages delivered.
- **Offloading Traffic from LTE to MANET to improve latency and reduce load (C++, Python)**
  - Offloaded LTE base-stations by strategically switching to wireless ad-hoc mode using ICN (ndnSIM/ns-3).
  - Experimented with caching strategies, packet statistics and device energy level to create forwarding strategy.

Engineering Intern: Zoho Corp, Web-NMS group, IoT subgroup, Chennai, India — February-May 2016

- Integrated the Modbus RTU protocol with their Web based IoT platform to monitor devices.
- Retrieved and wrote Modbus data from power meter connected to the server using Modbus RTU, Zigbee and 802.15.4 protocols.

ACADEMIC PROJECTS

Library Portal (Python, Django framework) — Current

- Designed a website using Django framework to provide an online catalog for a small local library, where users can browse available books and manage their accounts.

Implementation of Thread-based Web-Server (C++) — Spring 2017

- Developed persistent and non-persistent multi-threaded web server using C++ socket library.
- Handles both static and dynamic content of different MIME types.
- When tested using ApacheBench, the server was able to handle 100,000 requests with a concurrency of 10,000.

Secure Payment via Mobile Phones (Java) — Fall 2016

- Implemented a secure payment system modeled on Secure Electronic Transaction (SET) consisting of merchant, payment gateway and Android client.
- Used RSA keys, MD-5 hashing, certificates, timestamps and session keys for confidentiality and authentication
- Added one-time password and handled email notifications and database using Javamail API and SQLite respectively.

Analysis of Software Defined Network Switch (Python, Bash) — Fall 2016

- Analyzed trade-off between memory management and flows programmed per unit time by varying hard timeouts.
- Implemented Learning Switch using Pox controller and analyzed it in Mininet, for UDP and TCP traffic.
- Used the emulation results show that within multiple hard timeouts, T=8s is the most optimum.

IoT Based Precision Agriculture System (embedded C, Python, PHP, HTML) — Spring 2016

- Constructed a sensor-actuator system in a wireless sensor network consisting of Atmega 328 microcontrollers and Raspberry pi processor, using Xbee S2 transceivers to automatically and control the crops soil conditions.
- Hosted a web-page using Raspberry pi (apache server and python code) to display crop status.