

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

RELEVANT COURSEWORK

Advanced System Software Design, Algorithms, Computer Networks, Wireless Sensor Networks, Trustworthy Computing.

COMPUTER SKILLS

Working Proficiency: TCP/IP, NDN, C/C++, Python, Java, Android, NS3, Mininet, SDN, LaTeX

Intermediate Knowledge: NFV, JavaScript, MATLAB, R, Docker

EXPERIENCE

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

- **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.
- **Improving QoE of ABR Streaming Sessions through QUIC Retransmissions (Python)**
 - Analyzed 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.
- **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.
 - Expect to reduce cost and complexity for network operators.

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

Implementation of Thread-based Web-Server (github.com/deshmukhrajvardhan/MultiThreadServer) (C++) Spring 2017

- Developed persistent and non-persistent multi-threaded web server using C++ socket library.
- Used Chrome web browser to request content (all data formats(.txt, .jpeg, .gif, etc)).
- Demonstrated scalability and resource aware scheduling, by comparing the performance with Apache web server.

Secure Payment via Mobile Phones (github.com/deshmukhrajvardhan/MobileBankingSecuritySystem) (Java) Fall 2016

- Demonstrated proof of concept for secure mobile payment system by creating Mobile App using Android Studio.
- Created Certification Authority Server (X.509v1 certificates), Merchant Server and Bank Server using Java.
- Created Algorithm to secure the transaction process, using Secure Electronic Transaction (SET) Algorithm as a base.
- Implemented OTP during verification, email for notification and tested the system against various attacks.

Analysis of Software Defined Network Switch (github.com/deshmukhrajvardhan/SDNopenflowSwitchAnalysis)

(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. Tested with different hard timeouts and recorded programmed flow statistics.
- Used the emulation results show that hard timeout of T=8s is the most optimum.

IoT Based Precision Agriculture System (github.com/deshmukhrajvardhan/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 monitor and control the crops soil conditions.
- Programmed the Xbee S2 using XCTU software to adhere to the hierarchy of one root node and other leaf nodes.
- Used apache server, php, html and python with the Raspberry pi to act as the border router to host the web-page.