RAJVARDHAN SOMRAJ DESHMUKH

rdeshmukh@umass.edu | (413) 801-3878 | linkedin.com/in/rajvardhandeshmukh | https://deshmukhrajvardhan.github.io/

EDUCATION

Master of Science, Electrical and Computer Engineering — Expected Dec 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 — Feb 2017-Present

- **Scalable and low latency system for disseminating alerts in VANETS. (published) (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 faster than LTE based approach.
- **Improving QoE of ABR Streaming Sessions through QUIC Retransmissions (accepted) (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 DASH adaptive bit-rate streaming strategy SQUAD over application and transport layer protocols (QUIC, HTTP1 and HTTP2), on Cloudlab (testbed) nodes using Astream player (client application implemented in python) and Caddy (server side).
  - Implemented multiple stream requests over HTTP2 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 — Feb-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

- Implemented Learning Switch using Pox controller and analyzed it in Mininet, to observe flows created for various traffic like UDP and TCP generated by iperf. Implemented different hard timeouts and compared programmed flows.
- Used the emulation results show that hard timeout at T=8 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.