RAJVARDHAN SOMRAJ DESHMUKH

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OBJECTIVE

To gain industry experience and grow as a Computer Networks and Systems Engineer while making valuable contributions working in the fields of Networking, Adaptive bit-rate streaming and Wireless Sensor Networks.

EDUCATION

Master of Science, Electrical and Computer Engineering — Sept 2016-Present
Focus: Computer Networks | Advisor: Prof. Michael Zink | GPA: 3.71/4
University of Massachusetts Amherst, Amherst, MA, USA

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

RELEVANT COURSEWORK

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

COMPUTER SKILLS

Software: Android Studio, NS3, Mininet, MATLAB, LaTeX. Languages: C, C++, Java, Python, JavaScript.

EXPERIENCE

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

- Used NS3 simulation, to compare LTE-IP based approach to VANET-Information Centric Approach (ICN) in the case of disseminating alerts. (**published**)
  - Formulated and demonstrated efficient forwarding strategy
- Investigated adaptive bit-rate streaming strategies (SQUAD and BOLA) over application and transport layer protocols (QUIC, HTTP1 and HTTP2), on Cloudlab nodes (virtual machines) using Astream player (client side) and Caddy (server side).
  - Used python scripts and network tools to make goodput and packet measurements.
  - Worked on the client side to implement multiple stream requests over HTTP2 and QUIC
- Used NS3 simulation, to implement offloading LTE base-stations by strategically switching to wireless ad hoc mode using ICN, and compared various performance parameters to observe feasibility of this approach.
  - Introduced additional tags in the tlv packet to decide packet retransmission and worked on efficient forwarding strategy.

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.
- 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 (https://github.com/deshmukhrajvardhan/MultiThreadServer**)** — Spring 2017

- Created 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 (https://github.com/deshmukhrajvardhan/MobileBankingSecuritySystem**)** — Fall 2016

- Demonstrated proof of concept for secure mobile payment system by creating Mobile App using Android Studio for Client.
- Created Certification Authority Server (X.509v1 certificates), Merchant Server and Bank Server using Eclipse IDE (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 Masquerade and Replay attacks.

Analysis of Software Defined Network Switch (https://github.com/deshmukhrajvardhan/SDNopenflowSwitchAnalysis**)** — 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 the flows programmed.
- 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) — 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 soil conditions of the crop.
- 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.

CONFERENCE PAPERS

- R. S. Deshmukh and M. Zink, "An information centric networking approach for sensor to vehicular network communication in disasters," *2017 IEEE 13th International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob)*, Rome, 2017, pp. 227-234. doi: 10.1109/WiMOB.2017.8115849
- T. S. Chouhan and R. S. Deshmukh, "Analysis of DSDV, OLSR and AODV Routing Protocols in VANETS Scenario: Using NS3," *2015 International Conference on Computational Intelligence and Communication Networks (CICN)*, Jabalpur, 2015, pp. 85-89. doi: 10.1109/CICN.2015.26