Aditya Bhushan Patwardhan

2500 Avent Ferry Road #203 | Raleigh,NC 27606 | Phone: +1(919) 985 4851
Email: abpatwar@ncsu.edu | GitHub: https://github.com/adibpat **| LinkedIn:** http://in.linkedin.com/in/abpatwar

Education

- Master of Science in Computer Networking (**CGPA 3.8/4.0**)
  North Carolina State University , May 2016
- Bachelor of Technology in Electronics and Telecommunication Engineering (**CGPA 8.0/10.0**)
  Veermata Jijabai Technological Institute (V.J.T.I, Mumbai), May 2014

Skills and Relevent Courses

- **Programming Skills:** C(Core Competency), C++(Core Competency), CUDA, Python, Java, Matlab
- **Networking:** Wireshark, VIRL (Cisco), Linux Bridging, OVS (Open Virtual Switch), Open Daylight
- **Networking Protocols:** BGP, OSPF, EIGRP, SNMP, OpenFlow, NetConf, STP, HSRP
- **Operating Systems:** Linux (Ubuntu), Windows, OS X (UNIX) , IOS (Cisco)
- **Coursework:** Operating Systems, Parallel Computer Architecture, Network Design and Management, Internet of Things, Routed Network Design, Internetworking Protocols, Wireless Networking, Networking Services

Experience

Solutions Design Intern (Internet of Things) at North Carolina State University (June-August 2015)

- Tools: IBM Bluemix PaaS, MongoDB, Geo Location Analytics, NodeRED, IBM IoT Foundation
- Designed and simulated End-to-End Process Model for fuel saving of a fleet of cars

Academic Projects

Distributed Systems – Node Failure detection using Gossip Heartbeat Algorithm (C++, Sockets, Pthreads)

- Implemented Client/Server model for failure detection using User Datagram Protocol
- Provided a scalable solution with low convergence time by randomizing neighbor gossips

Feedback Prioritized Scheduler for Preemptive Threads (C, POSIX Pthreads, GDB, UNIX Signals)

- Implemented a Signals Handler to generate time-sliced periodic SIGUSR1 signal
- Implemented run queue and ready queue for scheduling

Non-Preemptive User-Level Threads Library - mythread.a (C, Futex, POSIX Pthreads, GDB)

- Provided create, yield, join and exit thread methods similar to pthreads
- Implemented context switches using futex calls
- Implemented idle thread which loops infinitely and yields

Synchronization Primitives for a User-Level Threads Library (C, POSIX Pthreads, GDB)

- Implemented Mutex, Conditional-Variables and Barriers as synchronization primitives
- Designed test-and-test-and-set (TTS) Lock using assembly instruction Compare and Swap (CAS)
- Provided Early+Late back-off functionality to TTS lock with 50 busy-wait loops

Buffer Overflow Attack Detection (C, UNIX Signals, Assembly Language, mprotect())

- Implemented a Signal Handler to block and test execution of return address of function

Parallelization of Page-Rank (TF-IDF) Algorithm (C++, GPU, CUDA, POSIX Pthreads)

- Implemented Bag-of-Tasks abstraction using Pthreads
- Replaced Pthreads with CUDA Kernel calls for Full Parallelism

Multi-processor Coherent Cache Simulator (C++, SMP, Open MPI)

- Implemented MSI, MESI and Dragon Update Protocols
- Implemented the Finite State Machine (FSM) for coherent caches
- Analysis of cache to memory transfers, interventions and invalidations

Network Function Virtualization using Click Modular Router (C++, Linux, Click)

- Implemented a packet processing router using the elements of Click Modular Router platform
- Designed Active Queue Management Modules: RR, WRR and Priority Scheduler using Click Modular Router
- Tested the schedulers using open source traffic generators – Scapy, Iperf, Ostinato
- Investigated the effectiveness of Round Robin and Weighted RR scheduling against Linux schedulers (FIFO)

Scalable Network Design (Cisco CLI, VIRL, Cisco IOS)

- Designed scalable networks using EIGRP and OSPF as IGPs
- Designed network with BGP as exterior gateway protocol to study features and management knobs of BGP
- Demonstrated BGP concepts including MED, Local Preference and Weight to influence routes