Chirag M. Shah

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Education:

- **University of Pennsylvania, Department of Computer and Information Science.**   **[August'2015 - May'2017]**
  Master of Science in Engineering in Embedded Systems.   GPA: 4.00/4.00
- **University of Mumbai, Dwarkadas J. Sanghvi College of Engineering.**   **[August'2011 - May'2015]**
  Bachelor of Engineering in Electronics and Telecommunication.   GPA: 3.88/4.00

Technical Experience:

- **Embedded Software Engineer Intern, Lutron Electronics, PA:** Developed a recommendation algorithm in **Python** to enable **Real-Time Learning** on an **Embedded Linux** based device. Made significant contributions by adding functionalities to a **concurrent server** written in **Golang** to integrate Sonos Speakers with the existing system.   **[May'2016 - Aug'2016]**
- **Summer Intern, Tech Cell, Godrej Security Solutions, Mumbai:** Designed hardware and developed firmware **(Embedded C)** to autonomously and rigorously test an industrial access control system.   **[June'2014 - July'2014]**

Honors and Awards:

- **Google Award 2017** for Search Engine (http://www.cis.upenn.edu/~cis455/hall-of-fame.html) which consisted of a scalable Distributed Mercator style crawler (which crawled 1.3 M documents in 3.6 hours), indexer (as described in Google's Paper), page-rank module (which handles dangling URLs), search algorithm (based on vector model for partial matching and supports features like auto-correct + completion, location specific results etc.) and UI (which has an admin page to monitor statistics and support for various 3rd party API's) .The system uses replication for fault-tolerance and also supports voice based search via Alexa.   **(Highly Scalable Distributed System, Java, BerkeleyDB, Redis, Distributed Databases, AWS, Elastic Map Reduce)**
- **PennOS Champs Award 2017** for developing a user-level operating system using the ucontext library. Kernel (consisted of a priority based scheduler, a signal handling module and system call APIs), File System (a FAT-like file system of 512KB used to store all the PennOS files which are pointed by the virtual file descriptors) and the Shell (used by a user to interact with PennOS) were the 3 major components of PennOS.   **(Operating Systems, C)**

Research and Teaching Experience at University of Pennsylvania:

- **Graduate Research Assistant, Distributed Systems Lab:** Contributed to the development of a fully event driven framework in C which enables applications to be written in form of minimum separable units so that they can scale well and utilize the existing resources efficiently under various DDOS attacks. **(http://dedos.cis.upenn.edu)**   **[Fall 2016, Spring 2017]**
- **Graduate Teaching Assistant, Software Systems: (https://www.seas.upenn.edu/~cis505)**   **[Fall 2016, Spring 2017]**
- **Graduate Research Assistant, PRECISE Lab:** Developed a Data Acquisition System for PB840 Ventilator using **BeagleBone Black** and **Java** based **Open Source Integrated Clinical Environment (OpenICE).**   **[Spring 2016]**

Projects:

- **Distributed Chat System:** Developed a multi-threaded group chat system designed to work over the network with mechanisms ensuring reliable delivery on top of UDP. Functionalities like Leader Election, Traffic Control, Message Priorities and dynamically changing group membership were supported by the System.   **(C, Distributed Systems, POSIX)**
- **HTTP(S) Application Server and Servlet Container:** Built a servlet container and an application server in Java which can be used to host web applications and supports static and dynamic content as well as sessions and cookies.   **(Java, Web Systems)**
- **Penn-Shell:** Developed a shell (similar to bash) which supports multistage pipelined jobs, terminal control, synchronous signal handling to handle foreground and background jobs, basic asynchronous signal handling.   **(C, Systems Programming)**
- **Map-Reduce Framework (using StormLite):** Developed a framework to run map-reduce jobs on top of stream data processing engine (similar to Apache Storm) which supports multiple nodes.   **(Java, Distributed Big Data Processing Systems)**
- **Gender Classification using Twitter data:** Developed a model (trained suing SVM and AdaBoost) using top words used on twitter over years by various users, their profile pictures and few features derived from images. **(Machine Learning, MATLAB)**
- **Content Coupled Surface:** A surface which dynamically inflates or deflates to address the problem of pressure sores. **https://devpost.com/software/content-coupled-surface**   **(Soft Robotics, ARM-mBed, node.js, Python, Raspberry Pi)**
- **ARM-Simulator**: Developed a simulator for an **in-order pipe-line** with caches, bypassing and branch prediction. Also, implemented modules for out-of-order pipeline.   **(Java, Computer Architecture)**
- **XPath-Engine:** Implemented a recursive-descent parser for validating and matching XPaths (based on limited grammar) given various documents crawled by the web-crawler. Also, implemented a highly efficient XFilter based algorithm to match multiple XPaths in parallel by using the SAX parser.   **(Java)**

Technical Skills:

- **Programming Languages:** C, Java, Golang, Python, C++
- **Hardware Platforms**: ARM-Cortex based MCU's, BeagleBone Black, RaspberryPi, Atmel, AtMega, mbed (LPC1768)
- Other: **Git**, **Software Testing**, Bash, AWS, Matlab, node.js, XPath/XQuery, Hadoop, Redis.

Extra-Curricular:

- Headed an initiative called RoboGen to spread technical knowledge among school kids in Mumbai, India.   **(Entrepreneurship)**
- Event Head during the Technical Festival at undergraduate level.   **(Leadership)**