SRIHARSHA MUCHELI

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PROFESSIONAL INTERESTS

Low-level and system software development, embedded systems, parallel and distributed computing, virtualization and containerization, cloud and cyber infrastructure.

EDUCATION

University of Arizona, Tucson, AZ

Masters, ECE ***GPA: 3.75*** (Aug 2015)

Computer Architecture, Parallel and Distributed Programming, Cyber Infrastructure Concepts, Fundamentals of Computer Networks, Operating Systems, Software Engineering, Probability Theory, Distributed Systems, Cyber-Security Concepts

Visveswariah Technological University, India

Bachelors, ECE ***GPA: 3.77*** (Interpreted by World Education Services) June 2009

WORK EXPERIENCE

University of Arizona, Tucson, AZ

Graduate Research Assistant, Advanced Traffic, Logistics and Simulation Lab October 2013 – Present (1yr 9 mths)

- Conceived and developed a complete package for **Software in Loop Simulation** of Roadside Equipment (RSE) hardware **using Docker.** Traffic control algorithms modeled using containers were able to achieve **up to 30x performance** gains enabling **2-3x hyper-time** simulations, **costing nearly nothing** (vs $6k/RSE). **Multiple researchers** using the setup **simultaneously** could deploy and/or manage **multiple simulation scenarios** eliminating dependency on hardware via easy per-container configuration and scripts to deploy and rollback multiple containers, saving at least **80% of time and effort**.
- **Critical Impact**: Compliance for **interoperability** was achieved through a stable daemon enabling apps to broadcast SAE-J2735 messages using IEEE 1609 (WAVE) protocols over 5.9 GHz 802.11p (DSRC) wireless communication channels.
- **Pedestrian App**: Pedestrians can issue road crossing request using a nomadic device (**Android** Smartphone)
- **Greatly simplified** porting apps to multiple platforms through a consistent and unified make/build/toolchain structure.
- Real world demos for various transportation committees (USDOT, FHWA, AASHTO, APTA, TRB, ITS World Congress)
- Support traffic research labs at **USDOT Saxton Lab**, **Booz Allen Hamilton,** and **Virginia Tech** in the use of SIL setup.

Samsung R&D, Bangalore, India

Senior System Software Engineer, North American CDMA Group June 2011 - July 2013 (2yrs 1mth)

- Bootloader mechanism to **prevent firmware tampering** in Android Smartphones with limited hardware-based security.
- **LCD driver ported** from apps bootloader to lower level **to provide TUI** for emergency upload/download mode.
- Kernel and bootloader support to **enable last_kmsg** for Android Mobiles to **preserve previous kernel logs** upon soft reset.
- **Privileged Daemon** to flush kernel logs to permanent storage in user mode kernels without privileged access to logs.
- **On site developer support at testing facility** in Huizhou, China for Android kernel, framework and platform layers.
- Analysis of bootloader/kernel logs, debugging online and memory dumps using **Lauterbach Trace32**.
- Delivery of Android kernel code for **Open Source Release** for 2 models.
- Part of the work experience and extensive training gained at **Samsung HQ**, Suwon, South Korea.

KPIT Cummins Infosystems, Bangalore, India

Software Developer, Bootloader Team, European Cars Division (EuCD) April 2010 – June 2011 (1yr 3mths)

- Designed and developed **API for Interrupt controller driver** on an NEC microcontroller.
- Developed Watchdog driver and CCP Protocol Driver for **Primary and Secondary Bootloader** for an NEC microcontroller which implements CAN protocol to communicate with a user-side tool.
- Extensive training in developing drivers for embedded systems such as CAN, PWM, RTC, ADC, UART

SKILLS

- **Programming**: C Programming, MPI, Shell Scripting, Python, Java, C++, Matlab
- **Platforms**: Linux, Windows, Android, Docker, Embedded Systems
- **Tools**: GNU Toolchain and Coreutils, Git, SVN, Perforce, Vim, GDB, Eclipse, etc.

PROJECTS

Coursework

- **MPI Profiler** for a distributed application using the **PMPI layer** and generate statistics and critical path. (CS522)
- **Redundant MPI** layer for fault-tolerant and reliable applications using Mirrored and Parallelized methods. (CS522)
- **One Time Pad Generator** written in **Python**, which encrypts a message with a One Time Pad of message length, generated as a function of a user-provided passphrase and a KeyStore file containing randomly generated bytes. (ECE509)
- Developed a **scalable distributed framework** for GRASS, a Geoscience GIS toolbox in Python. It can deploy broken down serial applications to worker nodes on cloud infrastructure (UA HPC) using Makeflow and Workqueue. (ISTA520)
- **Steganography**: **Android application** to hide text in images using **discreet wavelet** Haar transform. (ECE573)
- **Steganography**: A MATLAB project to **model the technique** implemented in the Android application. (ECE573)
- Tweeps: A **distributed application** using scatter-gather technique **using MPI** in C, developed to generate statistics from a corpus of Twitter connections data gathered from Stanford Network Analysis Project. (ECE677)
- Modelling a system used for service discovery in inter-process-communication in Connected Vehicles Research. (ECE576)
- DLXOS: Implementing multi-priority round-robin scheduler and virtual memory manager for an educational OS. (CS422)
- Remote controlled patrol and **surveillance robot** for final year engineering project, June 2009.

Personal Interest

- **Winner** of the Sponsor's prize by Raytheon for **Drone Hack** category at Hack Arizona, March 2015.
- Samsung India, 2013: Developed a **web application** for team members to participate in programming challenges with real-time compilation, execution, scoreboard and syntax highlighted source code browsing.
- **Hobby projects** for self-learning in math, algorithms, cryptography, system and application programming. (Project Euler, LeetCode, Cryptopals, etc.,) (ref: **Github profile**)
- Remote controlled **multi terrain, amphibious** vehicle for Robotics competition at IIT Bombay, Jan 2009.
- Autonomous **line follower and pick and place** vehicle for Robotics competition at IIT Madras, Oct 2008.
- **Organized** and **mentored** a **Robotics Workshop** on building an autonomous line follower robot, covering circuit design, choosing components, soldering them, writing code, programming microcontrollers and debugging the robot, Aug 2008.

REFERENCES

Dr. Larry Head	University of Arizona	Professor / Dept. Head	larry@sie.arizona.edu
Tami J Whelan	University of Arizona	Graduate Advisor	twhelan@email.arizona.edu
Periyasamy Paramasivam	Samsung R&D India	Reporting Manager	periyasamy.p@samsung.com