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Embedded Software Developer
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Education

- **Dharmsinh Desai University** Nadiad, India
B.Eng in Electronics and Communication, GPA: 3.3/4 *July 2008 - May 2012*

Professional Experience (4.9 years)

- **Mobile Internet India Pvt Ltd** Ahmedabad, India
Senior Embedded Engineer Apr 2016 - present
 - Development of Radius protocol sub-dissectors in wireshark 2.4.0 source code.
 - Development of Python scripts to automake tasks.
- **Volansys Technologies Pvt Ltd** Ahmedabad, India
Embedded Software Engineer Oct 2014 - July 2015
 - Board Support package porting on ARMv7 based Marvel board.
- **eInfochips Pvt Ltd** Ahmedabad, India
Embedded Software Engineer Jan 2014 - Oct 2014
 - Evaluation of TI6630K2L board peripherals.
- **Matrix Comsec Pvt Ltd** Vadodara, India
Software Developer Aug 2012 - Jan 2014
 - Development of new features as per requirements for IP-PBX telecom products.

Technical Skills

- **Programming Languages:** C, Python, Linux Bash Shell, LaTeX
- **Databases:** SQLite, MySQL
- **Machine Learning libraries:** NumPy, Scikit-learn, Pandas, Matplotlib
- **Linux Programming:** Multithreading, IPC, TCP/IP Socket Programming, Makefile
- **Platforms:** Linux (Ubuntu), Windows
- **Version Control Systems:** git, svn
- **Bus Protocols:** SPI, I2C, CAN
- **Network Protocols:** HTTP, TCP, UDP, Radius, Syslog, SNMP, MQTT
- **Development boards:** Raspberry Pi, Beaglebone Black, TM4C123, Intel Galileo, NodeMCU ESP8266
- **Software Tools:** Eclipse CDT, Keil μ Vision 4, Code Composer Studio, Visual Studio, PyCharm, Jupyter-Notebook, vim
- **Software Engineering Methods::** Scrum

Professional Projects

- **Data logger for Maritime**

Analysis of marine sensors' data in the cloud. (C, Linux kernel, SQLite, canboat)

- Ported custom Linux kernel 3.2 on TI AM335x Cortex-A8 based development board.
- Developed SQLite wrapper utility which manages data in SQLite database.
- Customized canboat utility which fetches NMEA2000 compliant marine sensor data from CAN bus, decodes it and transmits it to the cloud for analysis.

- **Thin client on ARMv7 based development board**

A customer wanted to build a dual display package on ARMv7 based board for thin client application. (C, Linux, Board Support Package)

- Ported Ubuntu 12.04 file-system and Board Support Package on Marvell PXA2128 SoC based development board.
- Implemented hot plug HDMI event by using udev rules.
- Fixed memory related bugs in galcore GPU device driver.

- **Embedded SMS Server**

Development of a server to convert the SMS to Email and Email to SMS in the Matrix IP-PBX products. The project involved developing the required features by following SMTP and POP3 protocols. (C, IPC, Makefile)

- Developed SMS PDU Encoder and Decoder module complying to GSM 3.40 standard.
- Developed SMS sender, SMS receiver, SMS delivery and System Timer modules to handle all SMS related activity on the system.
- Integrated Syslog and Busybox open source utilities into the product.
- Developed a wrapper module to encode and decode Unicode characters into UTF-8 format using libiconv.
- Developed bash shell scripts and makefiles to cross compile software modules with ARM tool-chain.

- **IP traffic monitoring using SDN switch**

Modification of Zodiac-FX SDN switch firmware to support packet filtering, de-duplication, tagging and aggregation. (SDN, Firmware, C)

- Developed a module to remove duplicate packets in real-time by comparing md5 hash of Ethernet packets.
- Configured HPE VAN SDN controller to do packet filtering and tagging.

- **Proprietary Wireshark**

Enhancements of Radius protocol dissector. (C, TCP/IP Networking)

- Developed sub-dissectors in wireshark to decode proprietary attributes of the Radius protocol.
- Implemented wireshark display filters of proprietary attributes.
- Managed the Radius protocol states dynamically and displayed the state information on packet details pane of wireshark GUI.

- **Real time IP data traffic accounting**

Accounting IP data consumption of users and plot real time graph on web application. (C, MySQL, TCP/IP Networking, PMacct)

- Customized promiscuous mode accounting(PMacct) utility to store accounting data in MySQL database.
- Developed Radius protocol decoder module using raddump library and integrated it into PMacct.
- Developed an algorithm which maps IMSI with IP address to maintain call states in PMacct.

- **GSM Engine Support**

This project involved evaluation of various GSM engines and adding support of respective GSM modules to Matrix IP-PBX and GSM Gateway products. (C, Windows)

- Evaluated GSM engines of different vendors like Quectel, SIMCOM and Sierra Wireless.
- Modified GSM library code to support tested GSM engines.

- **Computer Telephony Integration**

This project involved the development of TSP (Telephony service provider) driver for Matrix IP-PBX products. (C, Socket programming)

- Developed TCP socket client application which encodes and decodes proprietary protocol data.
- Developed Windows Registry module which would add/modify the configuration of any software installed in the windows system.