**Key Expertise:**

7 years of experience in Development and integration on embedded systems.

Proficient in Linux System programming using C and C++.

**Experience Summary**

* Currently working as a senior software Engineer in Larsen & Toubro Technology Services Limited, Bangalore from June 2012 to till date.
* Worked as Senior Software Engineer in GlobalEdge Software Limited.
* Worked as Engineer-C in GMRT (Giant Meterwave Radio Telescope), Khodad under TIFR (Tata Institute of Fundamental Research), Pune.
* Worked as Software Engineer with ThreeMedia Tech. Pvt. Limited, Pune.

**Work Summary**

* Currently working with Cisco for Vantage/RTN Project of client Rogers, Canada. Working for Designing and Implementation of Middleware module.
* Hands on experience and fair knowledge about OS Concepts, RTOS, STB architecture.
* Experience on STB MW, Embedded system, Linux device driver development as well as codec porting and microcontroller based development.
* Strong programming skill in C, CPP, Bash. Worked on python, perl, sed, awk etc.
* Good debugging skills. Well versed with different phases of SDLC: Analysis, Design, Implementation and Unit Testing.
* Experienced linux system programming, multithreaded programming, IPC mechanisms, socket programming, OOPS concept, Data structures.

**Skills**

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| **Hardware Platforms** | : | mips, Arm, Xtensa, AVR32, X86 |
| **Operating Systems** | : | Linux, Threadx. |
| **Languages** | : | C, C++, BASH. |
| **Technologies / Protocol / Standards** | : | MPEG2, STB, DLNA, UPNP, SPI, I2C, PCI, RS232, Modbus, TR69, snmp, |
| **Tools / Software** | : | IDEs and tools: vim, Source Insight, Eclipse, MPLAB, MS-Visual Studio, orcad, matlab etc  Debugging Tools: GDB, valgrind, memfence, strace, KDB, proprietary tools for thread and reboot analysis, wireshark, tcpdump, dvbsnoop, TSAnalyser  Version Control Tools: RTC, SVN, GIT.  Makery tools: GCC, Makefile, autotools, cmake  Other tools/instruments: DMM, CRO, DSO, Logic Analyzer, Spectrum and Network Analyzer |

**Project Details**

**Project 1:**

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| Project Name | Implementation of bulk source authorization for IPClient Boxes. | Duration | Feb 2015  To  Till date |
| Team Size | 4 |
| Description | IP client is RF-Tunerless IP based Settop box. It requests RF based STB (G8 Hardware) for various functionalities like video streaming, downloading metadata from Headend, Image download etc.  IP client doesn’t have its own conditional access module. So IP client uses webservices and SSE notification to receive authorization information from G8. This authorization information is used on IPClient to verify if tuned channel is authorized (source authorization) and package is subscribed (Package authorization) | | |
| Role& Contribution | Role : Developer  Contribution:   * Processing authorization information on G8 and caching it on IPC * Using webservices and SSE for transferring auth information. * Json node formation and parsing. * Unit testing of overall functionality. | | |

**Project 2:**

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| Project Name | Implementation of EPG client for RESTful web services. | Duration | Oct 2014  To  Till date |
| Team Size | 3 |
| Description | It was demoed in this project that EPG data can be loaded on STB dynamically from Webserver. This was POC for implementation of EPG server on cloud. | | |
| Role& Contribution | Role : Developer  Contribution:   * Writing client for webservices using libcurl APIs. * Implementation of json parser using libjson for EPG data. * Implementation of Demo APP and Unit testing with gtest. * Integration with Galio Emulator code. | | |

**Project 4:**

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| Project Name | Proxy Download support for IP client Boxes | Duration | Jun 2014  To  Oct 2014 |
| Team Size | 10 |
| Description | IP client is RF-Tunerless IP based Settop box. It requests RF based STB (G8 Hardware) for various functionalities like video streaming, downloading metadata from Headend, Image download etc. IP client uses webservices and SSE notification to send requests to G8 which performs Image download on behalf of IPC. | | |
| Role& Contribution | Role : Developer  Contribution:   * Implementation and bug fixing for Image download mechanism of IPC client boxes * Setting up TFTP server to support tftp download for G8 and IPC | | |

**Project 5:**

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| Project Name | Implementation of current video feature for RTN MW | Duration | Mar 2014 to Jun 2014 |
| Team Size | 4 |
| Description | Current video or live video is feature of STB which allows other devices to view currently tuned channel on STB. Vantage MW supports DLNA based Live streaming. Current video feature uses DLNA stack to support video streaming on DLNA compatible devices. | | |
| Role & Contribution | Role : Developer  Contribution:   * Implementation of DLNA specified Media Server Architecture. * Implementation of connection management and content directory services for Current Video * Streaming and teardown support for current video. * Testing on software and hardware DLNA clients. | | |

**Project 6:**

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| Project Name | Enhancement of close captioning features for RTN Middleware | Duration | Jan 2014 to Mar 2014 |
| Team Size | 3 |
| Description | FCC (Federal Communication commission) has mandated few improvements and changes in functionality of close captioning for cable settop boxes in North America. This project involves implementation of these features for RTN MW. | | |
| Role & Contribution | Role : Developer  Contribution:   * Enhancement in Character Edge attributes for CC. * Implementation of Preview screen for CC. * Easy reader functionality for close captioning. * Enhancement of background, foreground attributes of CC. | | |

**Project 7:**

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| Project Name | Enhancement of DLNA Mediaserver stack for G8 and G6 STBs | Duration | Jun 2012  To  Oct 2012 |
| Team Size | 50 |
| Description | RTN MW supports home-networking feature which allows STBs in home network to view inprogress and completed recording on other STBs. Rogers provide both high end DVR box (G8) and low end, low cost Non-DVR boxes(G6). DLNA software stack allows recording in G8 STB to be played in G6 STB. | | |
| Role& Contribution | Role : Developer  Contribution:   * Implementation of Vendor extended last change event feature. * Various bug fixes in CDS and Connection manager modules. * Bug fixes in playback, trick-plays, media streaming of remote recordings. | | |

**Project 8:**

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| Project Name | Enhancement of Diagnostic modules for G8 and G6 STBs | Duration | Nov 2012  To  Mar 2013 |
| Team Size | 50 |
| Description | RTN MW supports different health monitoring methods for local on screen diagnostic and remote diagnostic. Local diagnostic can be launched by special key combination on remote or can be seen in terminal with monitor commands. Whereas remote diagnostic is done through propriety tool - cmd2k and snmp. | | |
| Role& Contribution | Role : Developer  Contribution:   * Addition and modification of different hardware diagnostic information like tuner status, decoder information, network status, memory information on diagnostic pages * Addition and modification of diagnostics of software modules like DVR, MRDVR, Section Filter, Image download etc * Addition of snmp oids and corresponding mibs for G8 STBs. | | |

**Project 9:**

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| Project Name | Bux fixing for different STB software modules. | Duration | Jun 2012  To  Till date |
| Team Size | 50 |
| Description | RTN MW stack comprise of different software modules. | | |
| Role& Contribution | Role : Developer  Contribution:   * Analysis and debugging of different issues like lockup, thread deadlock, blackscreen, video freeze, unintentional reboots, oom. Out of event reboot etc. * Backtrace analysis using cisco proprietary tools for reboot issues * Heap analysis for out of memory and memory corruption issues. * Thread analysis for STB lockup, unresponsive remote keys and other deadlock issues in different MW threads. * Solved different issues in Encoder, MSP, DVR, MRDVR, section filtering etc modules causing blackscreen, video freeze, macroblocking, issues in playback and trick modes etc. | | |

**Project 10:**

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| Project Name | Development of LCD driver in ThreadX RTOS. | Duration | Dec 2011  May 2012 |
| Team Size | 2 |
| Description | This project involves development of LCD driver and Demo application in Threadx RTOS for SPEAr3xx mobile platform. Driver is written for TFT LCD panel with resolution of 800x480 by Innolux. | | |
| Role& Contribution | Role: Developer  Contribution:   * Writing the ThreadX driver in C for LCD controller peripheral in SPEAr300 SOC. * Writing demo application which uses LCD driver for displaying the images on LCD panel. | | |

**Project 9:**

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| Project Name | Development of device driver for CMOS Camera and TFT LCD in Linux | Duration | Jul 2011  Dec 2011 |
| Team Size | 2 |
| Description | The I2C based Camera device driver for Omnivision Camera OV9650 is written in Linux for AVR32 Processor AP70000 (for evaluation board ATMEL NGW100). This driver has to use API provided by Atmel-ISI which is based on V4L2 specifications. Similarly LCD driver is written for SSD2119 LCD module, which is SPI-device and it uses API provided by Atmel-LCD Controller. | | |
| Role& Contribution | Role: Developer  Contribution:   * Understanding of Image Sensor Interface (ISI) controller and LCD controller in AVR32 SOC. * Understanding the APIs provided by ISIC driver and LCDC driver. * Writing the driver for OV9650 camera module which has I2C as configuration interface. * Writing the driver for LCD panel which uses SPI as configuration interface | | |

**Project 11:**

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| Project Name | Porting and Testing of wlan device driver to Atlanta 2000 communication processor in Linux | Duration | Jun 2011  Jul 2011 |
| Team Size | 1 |
| Description | This project involves porting of Realtek wlan device driver (for RTL8192cd wlan module) to Atlanta 2000 communication processor having Xtensa Architecture | | |
| Role& Contribution | Role: Developer  Contribution:   * Understanding the PCIE interface for wlan module and PCIE driver provided with processor BSP. * Makefile and build related changes * Testing wireless networking interface | | |

**Project 12:**

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| Project Name | Development of VCCS (VOIP based Comprehensive Call System) application using PJSIP | Duration | Jan 2011  Jun 2011 |
| Team Size | 7 |
| Description | IP calls like p2p, conference, zone call can be made between different stations (ARM based TI’s OMAPL138) on which PJSIP is running. Asterisk is running on central server using which SIP negotiation is taken place. | | |
| Role& Contribution | Role: Developer  Contribution:   * Development of IPC communication using sockets to communicate among different software modules running on each station. * Implementation of software diagnostic module to check status of every other module. * Audio Latency reduction for ALSA lib by changing configurations. * Providing GPIO access from user space to software modules | | |

**Other Projects:**

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| **SN** | **Project Name** | **Responsibilities** |
| **13.** | Design of Generator security Unit using 16 bit PIC microcontroller. | Firmware development, Electronic design, schematic and layout design |
| **14.** | Design of Multi Parameter Monitoring System (MPMS) for medical Application using 16 bit PIC microcontroller. | Firmware development, sensors interfacing to ADC, PWM generation. |
| **15.** | Board Bring up for supporting Android on Panda Board | Bringing up the board using precompiled android kernel, Uboot and xloader binaries |
| **16.** | Adding 3 Way Audio Conference support in Vpacket-pipe application | Modifying existing statemachine to support 3 way audio conference. |
| **17.** | Customization of open source softphone ‘Qutecom’. | Adding support for video muslticasting, SAP announcement etc. |
| **18.** | Design of Noise Generator for FrontEnd System calibration. | Electronics design, RF layout design |
| **19.** | Design of RFCM (Radio Frequency Control Module) card | Electronics design, Schematic and layout design |
| **20.** | Porting of the Audio and Speech codecs for fixed point processor | Cycle profiling, Optimization and porting, integration and testing |

**Educational Qualification& Certifications**

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| B.E | Electronics and communication from University of Pune (2004-2007) with 63.00%. |