CURRICULUM VITAE

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OBJECTIVE

Good working knowledge of security solution in embedded products. Good experience in the design & development of embedded system software. Seeking a place to work that gives me opportunity to make best use of my knowledge while being innovative and resourceful.

TECHNICAL SKILLS

Programming – C++, C, System Programming, threading, Python, Python-qt framework, Device Drivers, Socket Programming, Shell scripting.
OS – Linux, Windows
Utilities – cmake, make, strace, GDB
Version Control Tool – Git (Gerrit, Stash)

- Expertise on Yocto build system.
- Extensive hands on programming experience in C, Python, Python-qt, C++, and Socket Programming.
- Expertise on DAC and MAC based sandboxing like SMACK, AppArmor, SELinux know-how.
- Hands on experience in firewall component design and implementation.
- MTK based Secure Boot/Verified Boot verification.
- Good understanding of TEE Architecture and TA & CA development with Cryptography knowledge.

EXPERIENCE

Harman International, (December, 2017 – present)
Engineer II
Role – Embedded Security Engineer

- Working in Embedded Security Group for different Infotainment and Telematics project.
- Working with customer and understanding their requirements.
- Traveled 2 times to Germany for supporting counterparts.

TATA Elxsi, (March, 2015 – December, 2017)
Senior Engineer
Role - Embedded Developer

- Worked in development team of Linux based Infotainment project.
- Worked in development team at Client location, Mercedes Benz Research & Development Center Bangalore

PROJECTS

1. **Embedded Security Group Products (Harman International)**
   Role: Design and Development
   Language Used: C, C++, Python, Shell scripting

Project Description & Responsibilities:-

- **Sandboxing**
  Providing DAC and MAC based sandboxing for different OEM like Daimler, PSA, BMW, MAN, and FCA for their IVI and telematics projects. Leading all sandboxing Linux based solutions.
  Running all processes with non-root user, finding out POSIX capabilities if required any by the processes. Changing file access permissions for non-root user. Integrating all the changes in Yocto build system.

Debugging for sandboxing is achieved by tools like strace, lsof, audit.

- **Firewall Manger**
  Designed and implemented firewall manager in C++. Firewall manager internally uses iptables command to load firewall rules. Firewall manager can load static firewall rules at system startup very early. Firewall manager also provides interfaces for dynamic rule loading. It exposes Dbus API for dynamic rule loading, which can be called by client applications.

- **Secure Boot**
  MTK based Secure Boot verification of all the images with DM-Verity.
  Signature decoupling implementation of LK, BL33, TZ, Boot and Rootfs images for customer.

- **ARM Trusted Execution Environment TA & CA Development**
  Developed Key Store Trusted application and client application with Openssl cryptography support.

- **Key Management Server based Image**
  Developed KMS based image signing python scripts. KMS is attached to HSM module.

2. GENIVI Complaint Linux based Automotive Infotainment System (TATA Elxsi)

Role: Design and Development
Language Used: C++, C, Python
Microprocessor- iMX6 (ARM based)

Project Description:-

Bringup Genivi complaint infotainment software on Freescale iMX6 SabreSD board with features like Media player, Vehicle information, Remote Vehicle Interaction, Smart Device link with cool HMI.

Responsibilities:-

- **Board Bringup**
  Creation of custom linux distribution using Yocto Build system for NXP i.Mx6Sabreauto, Renesas Porter M2, Intel Minnow board.
  Made custom recipes for different middleware.
  Middleware integration and audio management.
- **RVI Component**
  Was responsible for implementation of middleware in python for RVI (Remote vehicle interaction).
  RVI was connected to Smartphone RVI App over wifi.
  Made innovative features like controlling media, controlling hvac, getting vehicle information on smartphone.
- **Home Automation Server**
  Made home automation server in C++ which is controlled through RVI was running on IVI system. Home Automation Gateway (Raspberry pi) was connected to Philips Hue lights. Home Automation Gateway and IVI are on network through wifi. Lights can be controlled on IVI system through RVI.
- **Systemd Startup**
  Was responsible for creating systemd unit files for all middlewares and HMI apps, analyze their behavior and sequence them to save user-space boot time.

3. Python based Tool development for ADAS in Mercedes Benz Research Centre.

Role: Design and Development
Language Used: Python, Python-qt, C++, C

Project Description:-

- Developing a Python Qt based Converter tool which converts raw measurement file to IDTB (Indexed data Toolbox) format using ADTF. IDTB format files can be easily used by VizDesk (a visual ADAS validation tool).
- Involved in development of C++ based ADTF filter communicating with VizDesk using UDP sockets.
- Designed and coded architecture for server client communication for ADAS labelling tool in python.

4. **Communication between Beaglebone and android device via USB using TI Starterware (PG Diploma Project):**

   Platform: ARM
   Languages Used: C (Firmware coding), Android programming

   Project Description:-

   Used TI's Starterware for Beaglebone as the base software and integrated the android accessory protocol and a accessory application, which is connected to Android powered device over USB.

   The Beaglebone operates in USB host mode and the android device acts as USB device that runs an android application which interacts with Beaglebone application to control the peripherals on Beaglebone.

EDUCATION

Degree	Institute	University	Year	Marks
PG Diploma (Embedded Systems Design)	CDAC-ACTS, Pune	CDAC	2014-2015	79.2%
B.Tech. (E.C.E.)	Ideal Institute of Technology, Ghaziabad	UPTU	2010-2014	74.4%
XII	A.V.B. Public School, Patparganj, Delhi	CBSE	2008-2009	80.6%
X	S.D. Public School, Pitampura, Delhi	CBSE	2006-2007	80.5%

ACHIEVEMENTS

- Won ‘Take a bow’ appreciation for Sandboxing for Daimler project and firewall manager.
- Best Sprint Performer in for one quarter.
- Won Bravo Award for my efforts in GENIVI complaint Linux based Infotainment system Project.
- Won 1st prizes in “Genero’13” and “Genero’12” in events Circuit design and Line follower in ABES Engineering College, Ghaziabad in 2012 and 2013.
- Participated in "Techkriti 2013", an annual technical fest at IIT Kanpur in events Embedded and Electromania in March, 2013.
- Finalist in “Esya 13” in event Robocon held at IIIT,Delhi in August 2013.
- Won 3nd prize in Technical presentation event named Ideaz organized by APEX committee of college in December, 2012.
- Student coordinator in Technical committee of College in 2012.