Alex W. Chang

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SUMMARY:

Energetic software engineer with entire 24+ year experience developing robust code including all levels of products: 10+ year of embedded device, 5+ year of server product and 2+ year of QA automation. Design/architect software framework and advise engineers the solution to implement all the pieces of subsystem under architecture. An enthusiastic team player and deep creative thinker.

SKILLS:

- ***Languages:*** Java, JNI, SQL, C/C++, Python, Rust, ADA.
- ***WWW:*** DHTML/HTML5, XML/JSON, CSS, JavaScript, PHP.
- ***Operating Systems:*** Windows, RTOS, Embedded Linux, QNX.
- ***Embedded Platform:*** ARM, MIPS.
- ***Others:*** DirectFB, GTK+, Jamvm, J2ME, Shell Script, Socket, Multithreading (IPC), Quality Assurance. Aspera, Amazon Web Services (AWS)

PROFESSIONAL EXPERIENCE:

Technical Specialist, Lucid Motors Inc., Newark U.S.A - Jan 2021 – Present
Telematic/Connectivity team -- Designed and developed the Lucid OTA client to enable comprehensive over-the-air software updates for TCUs and ECUs across all customer/engineering vehicles in North America, Europe and Saudi Arabia. Redesigned the next-generation Lucid OTA architecture and developed new in-house OTA middleware, which improved efficiency by 60% and reduced licensing and partnership costs by 90%. Optimized the workflow, code of C, C++17 and Rust to enhance code performance and reduce its size.

Staff Software Engineer, Yahoo., Sunnyvale U.S.A - Feb 2020 -- Jan 2021
Focus on developing integrated platform solutions for both external customers and internal business teams. Operate in a fast-paced, collaborative environment that aims to quickly deliver value to the business we serve. Additionally, understand the existing robust C++11 code running on BSD and make necessary adjustments to ensure a smooth migration to Linux.

Staff Software Engineer, Byton Inc., Santa Clara U.S.A - May 2019 – Sep 2019
Collaborate with a team of connectivity engineers responsible for firmware across various domains, including OS, applications, networking, routing, and RTOS. Enforce secure firmware configurations and design end-to-end connectivity systems. Ensure the seamless integration of connectivity technology into vehicles. Implement vehicle network architecture, incorporating subsystems such as key fob, infotainment, PowerMode, and immobilizer, using vehicle communication protocols like CAN, CAN FD, Ethernet, and LIN. Develop embedded code in compliance with MISRA and AUTOSAR standards.

Staff Firmware Engineer, NIO Inc., San Jose U.S.A - May 2018 – May 2019
Autonomous Driving team – Conduct research on technologies that integrate system modules using multiple programming languages, including Python (with pybind11), C/C++14, and Ada. Focus on implementing the NIOPilot framework for Level 4 autonomous driving vehicles. Leverage problem-solving skills to enhance the message delivery system, incorporating protocols such as CAN, LIN, and Chassis, as well as shared memory and Ethernet on QNX.

Lead Software Engineer, Verizon Labs (Former Intel Media Group) - Feb 2014 – Apr 2018
Research, design and implement software architecture of STB middleware, smart home framework by voice and content delivery server cluster. Direct team engineers to implement modulized subsystem under architecture. Plus develop product automation system for QA/release team. Research new technology and advise the possibility of integrating to current software stack. Develop drivers with protocols such GPIO, UART, I2C and SPI with embedded Linux on ARM microcontroller.

Lead Software Engineer, Intel Media, Santa Clara U.S.A - Aug 2012 – Feb 2014
Liberate Access to Digital Media. Delighting consumers with beautifully crafted products, putting them in control of their media. Responsible on develop and deliver software and phones and tablets in the near future. Keep a passion for delivering products that redefine how media is consumed in the world today. Primary responsibilities are developing, implementing, debugging and testing in Digital Video, STB, Encoding and Conditional Access. Build, Integrate and Validate the composite of multiple software components, embedded OS and devices. Integration of Applications and Firmware and validation of APIs and database. Build-out and deployment of IPTV networks and infrastructure.

Integration Engineer, Cisco Systems, Inc., San Jose U.S.A - Aug 2008 – Aug 2012
SPVTG – Involved in the design, development, and maintenance of real-time OCAP middleware modules for Linux and PowerTV based set top boxes. Work closely with engineers in multiple geographic areas including San Jose (CA), Huntsville (AL) and Chennai (India) and apply problem solving skills in technical areas and consider portability of code across a multitude of platforms.
VCPBU CDS-TV -- Software integration of IPTV/MOD server-side components is the main responsibility. Focus on MPEG-2/MPEG-4/H.264 ingesting and streaming on CDS (Content Delivery System). Also implement software components with Backoffice like EventIs and ITVManager and Widevine as encrypted server. Develop tools in C/C++ and testing reliability and capability of content streaming on cable infrastructure. After integration, QA process is taken include composing Test Plan and running aggression and longevity tests. RTSP/UDP is the protocol to use for command session setup and streaming delivery. Network and socket knowledge/skill are applied in this software integration.

System Software Engineer, HCL Technologies America Inc., Santa Clara U.S.A - Nov 2007 – Aug2008
Responsible on integrating OCAP stack and embedded Linux system for CATV product. Develop and implement software stack with Magnum kit on Broadcom 974xx chipset as a glue layer between user level and driver level software. CTP testing procedure and journal result analysis is taken. Research and analysis ATP/PICS requirement (OOB, CCIF, DOCSIS, DSG specification etc.,) for Certificate Wave by CableLab. Core Java (jmf, jsdk and pbp), C/C++ and shell script are used.

Senior Software Engineer, ASUS Computer Inc., Taiwan - April 2005 – Oct 2007
The main task is to develop embedded and networking devices like Set-Top box and implement a QA testing procedure to ensure optimization of products. Also, integrate and write firmware drivers as interface to invoke the functionality provided by hardware. Integrate variety of set-top boxes like IPTV, satellite and CATV set-top box. Debugging with measurement equipments, oscillioscope (datasheet, schematics) to check hardware functionality. In some projects, play a coordinator role to communicate with other teams and clients to proceed on a smooth flow. Porting GTK+ DirectFB as primary graphic back-end. Java development is utilized for upper-layer GUI application and JNI is the interface communicating with C/C++ low-layer modules/libraries.

RD Manager/Alpha-Team Leader, 360SUN Digital Broadband Corp, Taiwan - Jul 2002 -- Feb 2005
Responsible on leading RD department to research and implement domain technologies/knowledge for the company. These research include the survey and documentation of new media technology and knowledge subprojects including: Interactive TV System(Set-Top box), VOIP(H.323/SIP), Streaming and Middleware. Design Java IPTV middleware which provides variety of services. Also develop the downloadable application called Sunlet like Xlet in MHP or OCAP, but without XAIT/AIT locating service applications/monitor application. Define/develop the API in the platform for applications call. Utilize JNI technique to communicate with firmware drivers wrote by C language.

In that way, Java application can call functionality that system level provides. The Multimedia Interactive Platform project has been supported by the economy department of Taiwan government.

I/T Specialist, (Lucent team merged) IBM Global Services Consulting, Atlanta U.S.A - Sep 2001 – Jun 2002
Plan, design, develop, test, and support AD/M Application Integration systems and provide application solutions to meet customers' requirements. Design, develop, and re-engineer highly complex, scientific, state-of-the-art application components. Perform routine modifications of technical designs and maintenance of application components.

System programmer/Software Engineer, Lucent Technologies, Atlanta U.S.A - Jan 2000 – Sep 2001
Responsible for updating/porting the multi-module ScanCenter application from 16-bit environment to a 32- bit environment. Some of the applications were web-based and utilized Microsoft tools and applications to provide features and functions that were easily understood and allowed the end users to assimilate them into their work environment with minimal training.

MAJOR PROJECTS:

- ***Lucid OTA Framework***
  TCU communication with infortainment, BCM, and other units based on well-define PDUs in ARXML, utilizing multiprocessing. Apply Unified Diagnostic Services (UDS) and Diagnostics-over-IP (DOIP) and ostree image built by Yocto bitbake and Jenkins build with receipts (.bb files)

- ***CDS for IPTV***
  Design and develop high speed CDS. This system supports extensive media transferring and satisfies the requirements of load balancing, failover, cluster management and notification (IPC callback).

- ***IoT Smart Home on Voice***
  Create smart home framework which control home appliance by voice commands such as lightening, locks and sprinkler. This framework integrates 4 major protocols: Zigbee, ZWave, WiFi and BLE to attempt at high compatibility of IoT appliances on recent market.

- ***OnCue/Next-Gen FIOS Middleware***
  Architect Verizon next generation of STB middleware. This generic HAL is integrated to FIOS STB, OnCue IPTV box and DVR device. Instruct team engineers to develop module components of audio, video, closed caption, diagnostics, frontpanel, software update, auto provisioning and network to connect to the middleware.

- ***E2AF Automation***
  Design and architect an automation framework for test unit including STB, and cloud/voice products. Define webservice APIs and design reporting, notification and callback mechanism to facilitate system validations. Main achievements are Voice-on-Cloud system and TestRunner plughin automation.

- ***Comcast/Panasonic RNG218 OCAP***
  Cooperated with Panasonic to develop a high performance cable receiving device that incorporates support for multiple tuners, all-digital signal formats, HDTV and DVR for Comcast. Following OCAP specification, this device was integrated with Broadcom chip 974XX and CFE bootloader, and ran in CTP test environment. This MIPS-based device was developed by C/C++, java and jvm programming technique and uclinux.

- ***BSkyB DS440 based on Open-TV Platform***
  Cooperated with Pace Micro Technology to develop satellite Digibox for BSkyB, the largest digital TV operator in UK. Integrated OpenTV middleware and designed VTS and TestTask testing procedure to satisfy quality assurance. This ARM platform was developed by using ICE tool and C language. This product is based on Nucleus Real-Time OS.

- ***NetRadioTV Multimedia Platform***
  Leaded RD department developing Interactive Television (ITV) which provides services: CATV, Karaoke, Movie, Music, Walled Garden, User Interaction,, PDVR, TV-Mail, Video-Phone. This multimedia service platform was integrated of technologies including Java, JNI, C/C++, MPEG4, Streaming, H.323(or SIP) profile and PKI. This project was to design hardware (Set-Top box), firmware, software and back-end system (Streaming server, Database server, Application server and Web server).

- ***System Communicator***
  Developed a control software using API and task scheduler to communicate with ALLVIEW applications' behavior and schedule the execution time for these applications. These ALLVIEW applications were EMS, SITE, Virgos, NIM-ER, EMP, MESA, NightHawk, ELF, RSB and InFoBank. This project was to design the process flows of these applications, program functionality of these applications and integrated these applications with the System Communicator. The PIPE technique was applied on the System Communicator for communicating with these applications.

- ***West Region ALLVIEW/ERM Distribution Requirements***
  Developed four project components: SPL, AUTO, EMAIL and CD-ROM, using XML and FTP technologies. SPL and AUTO were paper distribution of drafted completed Job Drawings to customers. The system automatically queried the database, retrieved images of the specified issue or higher, overlay label information, created a print job and sent it to the designated remote printer. ALLVIEW provided an error report of the requested images that were not attached/imported and available to be included in the original print job.

EDUCATION:

Georgia State University Atlanta, Georgia, December 1999
B.S. in Computer Science and Mathematics

PMI, Project Management Institute, January 2008
PMP (Project Management Professional) Certification