Zhiqiang Xu

Software Architect

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Work as a hacker. Hack as an artist.

PROFILE

- Bachelor's degree. 18 years of embedded software development, 2 years of management experience.
- 7 years in automotive projects, 7 years in mobile phone R&D, 4 years in robotics R&D.
- Proficient in Linux development environment, kernel driver development and debugging.
- Skilled in using scripts to automate system integration and development environment.
- Proficient in C language, Bash script, Git version control, and capable of doing some development and application based on Docker.
- As a hobby, I enjoy Lisp and its dialects.
- Actively participate in open source projects, including tmk keyboard, RT-Thread, koreader, proxmark3, etc.
- Eager to learn and respect technology, with 8 authorized patents as the first inventor.

EDUCATIONAL QUALIFICATIONS

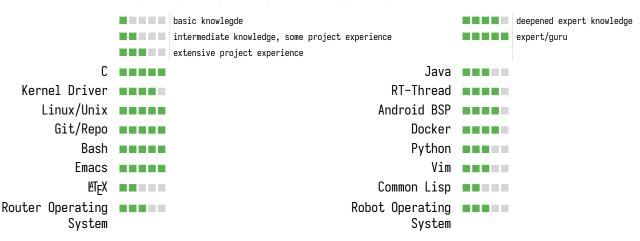2002.09 – 2006.06 **Bachelor of Traffic Engineering**, *Hohai University*, Nanjing

LANGUAGE SKILLS

English	CET4	*Normal*
Japanese		*Normal*

TECHNICAL SKILLS AND KNOWLEDGE

▪▪□□□ basic knowlegde
▪▪□□□ intermediate knowledge, some project experience
▪▪▪□□ extensive project experience
▪▪▪▪□ deepened expert knowledge
▪▪▪▪▪ expert/guru

C	▪▪▪▪▪	Java	▪▪▪□□
Kernel Driver	▪▪▪▪□	RT-Thread	▪▪▪▪□
Linux/Unix	▪▪▪▪▪	Android BSP	▪▪▪▪□
Git/Repo	▪▪▪▪□	Docker	▪▪▪▪□
Bash	▪▪▪▪▪	Python	▪▪▪□□
Emacs	▪▪▪▪▪	Vim	▪▪▪□□
LaTeX	▪▪□□□	Common Lisp	▪▪□□□
Router Operating System	▪▪▪□□	Robot Operating System	▪▪▪□□

PROFESSIONAL EXPERIENCE

2022.04 – Present **Senior Software Engineer,** *Zeekr Automobile (Ningbo Hangzhou Bay New Area)*, Shanghai
Responsibilities: Design and development of the SOA communication platform architecture for automotive cockpit systems.

- Designed the middleware architecture solution for the Zeekr Automotive intelligent cockpit SOA communication platform.
  - Developed SOA communication components for Zeekr Automotive 2.x platform vehicles based on open-source vsomeip and commonapi.
  - Designed and implemented a Docker-based development and compilation environment to ensure consistency in compilation environments for each target version. Provided single-machine communication simulation for SOMEIP services and online step debugging capabilities to enhance the development efficiency of SOA components.
  - Led the team to design and implement tools for converting communication matrix design files into C++ and Java code. This allowed for quick initiation of service business development based on template projects converted by the tool during the development of native and Android programs.
  - Led the team to design and implement the SDK of SOA components, allowing the SOA SDK to be compiled and adapted to support Linux, QNX, Android, and other operating systems, thereby achieving platformization of communication components.
  - Developed a SOMEIP Ethernet packet parsing tool, which parsed SOMEIP Ethernet packets into service interfaces and corresponding data content based on communication matrix definition files. This tool improved the efficiency of service data confirmation to some extent during middleware development and service integration.
  - Designed various business integration and automation tools based on the inconvenience of using development prototype interfaces. Combined with ADB and ROS routers, these tools enabled the development computer to access the prototype network, facilitating simulation integration and debugging of services.
- Developed business integration tools for the ZKOS communication solution
  - Verified its tool capabilities and communication framework capabilities.
  - Wrote service interface testing programs based on the SOA service definitions of the 3.0 platform models.
  - Developed service validation tools to simplify the process of using ZKOS for development, compilation, deployment, and running test programs.
  - Participated in and guided the detachment solution of the ZKOS SDK.
- Developed the Ethernet diagnostic architecture for the 3.0 platform and implemented its prototype. Developed Ethernet diagnostic services for the 3.0 platform.

2019.10 – 2022.03 **Software Architect,** *SAIC MAXUS*, Shanghai
Responsibilities: Revision and maintenance of OTA protocols for automotive networking systems, design and definition of intelligent cockpit software architecture, and refactoring work.

- Self-built networking OTA protocol revision and maintenance work.
- Establishment of the basic development toolchain for the intelligent cockpit team and configuration of continuous integration services.
- Formulation of clock calibration strategies for domain controllers.
- Research and architectural design of container-based single-core multi-system solutions.
- Qualcomm 8155 intelligent cockpit project
  - Architectural design of CAN signal to system interface in the QNX+Android solution.
  - Responsible for the development and debugging of the air conditioning module in the Zebra L+L solution.
  - Communication and definition of SOA signal matrices.
  - Confirmation of design details of HD map compilation, matching, rendering, etc.
  - Architectural design and technical details communication for co-operating navimap between front IVI and rear IVI.

2018.06 – 2019.09 **Senior Software Engineer**, *Shanghai Yunshen technology Co., Ltd.* , Shanghai
Responsibilities: Robot software architecture design and implementation, and construction and maintenance of company R&D environment.

- Sensor development
  - Implemented CAN driver for STM32F4 under RT Thread, and wrote and implemented communication nodes for CAN analyzer under ROS.
  - Developed a sensor development framework based on RT Thread, defined communication protocols, and developed ROS nodes for the host computer.
  - Designed and implemented a sensor firmware upgrade solution based on CAN bus technology.
  - Developed a UWB-based indoor positioning solution for holographic projects.
- Robot control system
  - Standardized output and packaging of robot system and software nodes, enabling deployment into target machines within 20 minutes after software update and approval.
  - Ported and configured Intel Realsense drivers and ROS nodes, ported facial recognition algorithm nodes, and resolved camera hot plug issues.
  - Construct system image for central controller, which is also used for factory production.
  - Formulated deployment plans for internal routers of robots, implemented automatic link switching between 4G and Wi-Fi uplinks, and supported VPN dialing to the company's intranet for business maintenance. Additionally, supported interconnection between internal third-party devices with different sub-network settings.
  - Designed and implemented the online upgrade (FOTA) function of robot ROS system programs.
- System management
  - Compiled and implemented ROS Docker environment images, and built a company Docker image library server.
  - Established and maintained Gerrit version servers, Jenkins compilation servers.
  - Configured AP roaming and QoS based on ROS (Router Operating System).

2016.07 – 2018.05 **Software Solution Expert**, *Shanghai clever mrobot technologies Co., Ltd.* , Shanghai
Responsibilities: Robot software development and software architecture design.

- Developed Android tablets based on RK3288 chips, responsible for RK818 battery management and optimizing system startup processes.
- Developed sensor drivers, interfaces, and main control logic based on the NVidia TX1 industrial control board.
- Standardized system install method for control board to improve installation efficiency.
- Explored the implementation of robot runtime based on ROS under Docker.
- Standardized ROS program compilation systems and packaging processes.
- Designed and implemented a flexible architecture for automatic robot program upgrades.
- Researched and used RTOS to refactor MCU development architectures, reducing development and maintenance costs, and promoting the use of open-source GCC to build target programs.

2010.06 – 2016.06 **Embedded Software Engineer**, *Shanghai Phicomm. Inc.*, Shanghai
Responsibilities: Mobile phone development

- Developed Android smart device projects based on Marvell and Qualcomm platforms.
- Developed and promoted one-click installation and configuration of Qualcomm compilation environments for both Windows and Linux.
- Implemented Docker packaging for a complete Android compilation environment to provide consistent compilation configuration and environment.
- Developed and promoted Android distributed caching compilation optimization solutions based on ditcc and ccache.
- Developed sensor drivers and implemented HAL and corresponding frameworks. This includes gyroscope, magnetic, gsensor, psensor, lsensor, and touch panel (TP) sensor devices.
- Responsible for the logic development of power management, including battery modeling, charging and discharging strategies, and multi-channel charging switching.
- Optimized and improved battery modeling and BMS algorithms in particular during work.
- Optimized console-based development environments and development tools, greatly improving project efficiency.

2009.10 – 2010.06 **Embedded Software Engineer**, *Shanghai iBingo network technology Co., Ltd.*, Shanghai
Responsibilities: Development of dynamic mobile phone themes and special effects (iShow theme system).

- Developed dynamic themes and menu effects for mobile phones based on the MTK platform.
- Implemented a dynamic screensaver with unlimited color-changing streamer effects.
- Created a dynamic screensaver with dandelion effects that distinguish between day and night.
- Developed scripts for auto compiling, auto packaging, and auto releasing.
- Improved and perfected the HTTP download program on mobile phones, supporting resume downloads.

2008.11 – 2009.10   **Embedded Software Engineer,** *Shanghai Dragontec Group*, Shanghai
Responsibilities:Japanese outsourcing job.
- Digital TV for Hitachi development.
  - Responsible for interface development and code testing in Hitachi's digital TV project.
  - Ported from VxWorks to Linux. Improved development environment and quickly resolved issues.
  - Ported OpenVG project, responsible for main program porting, unit test code writing, and regression testing.

2008.06 – 2008.11   **Java Engineer,** *Kyrocera Mita*, Oosaka
Responsibilities: Developed KMCapture Solution, an electronic document solution for hospitals.
- Designed, coded, and tested Controller, Facade, and part of the Storage module.

2007.05 – 2008.06   **Embedded Software Engineer,** *Hitachi ICS*, Hitachi
Responsibilities: Developed AVCCore, a vehicle project based on ARM processors, later used in the Cadillac CTS 08, 09 models' car audio systems.
- Integrated iPod application, responsible for developing and maintaining iPod Controller and iPod CoreApp in the vehicle computer.
- Developed and maintained audio file header parsing in the vehicle computer.

2006.07 – 2007.05   **Java Software Engineer,** *Nanking University Dragontec*, Nanking
Responsibilities: Developed an online maintenance management system for vending machines for Suntory.
- Wrote database processing code and testing code.
- Wrote automation deployment scripts.

HOBBIES

Reading   Technology, Novell   Sports   Skate Board, F1, Marathon

GRANTED PATENTS

201510477097.X	Login authentication method and system
201510612722.7	System for expanding operational capability of mobile terminal
201410613796.8	Mobile terminal and achievement method of virtual drive of same
201210368281.7	Headphone interface device and control method based on the headphone interface device
201510745100.1	A kind of key encryption method and system, electronic equipment
201210585845.2	Hardware and firmware independently updating system and method thereof
201420615063.3	A kind of mobile phone water enter preventing device
CN201811304800.7A	Generation method of thermodynamic diagram of active area and server

MISCELLANOUS

Contributed 3rd party projects   **github**
- twip: Added proxy support.
- ChinaDNS-C: Fixed bugs and ported to tomato.
- Koreader: Fixed bugs and optimized compilation speed.
- tmk_keyboard: Added bluetooth support for usb2usb.
- RT Thread: Fixed STM32F1 bsp bugs. Wrote CAN driver for Stm32f4 using hal library.
- ChameleonMini-rebooted: Added NTAG-213、215、216 support.
- lsp-sonarlint: An Emacs plugin from using sonarlint as a lsp backend to help checking codes rules. Added c/c++ checking support.

My projects **github**

- vim_configs: Vim configure used for co-workers.
- battery_analyzer: A tool that auto sampling and use spline method to generate SOC table for battery driver
- csr_tool: Script which can dump firmware from CSR chips.
- Ultramanmedal: A lua script which can generate tags for zeta ultraman.
- bin2elf: Add elf header for bin file.
- wintoolset: An environment for running script tools under windows.
- trc2asc: Convert trc file which is saved by peak apps to asc file.
- asc2blf: Convert ASC to blf or blf to asc.
- exportdrawio: Export png svg pdf files from a drawio file.
- crackmfkey: Auto download sniff data from chameleon and calcuate keys out.