# Hi, this is Richard and I am a senior embedded software developer.

I have a bachelor's degree in Computer Science and more than 8 years of experience in the field of embedded software development.

I am proficient in C language, C++, Java and Python languages and I have strong experience and knowledge in developing Linux software, device driver, firmware and applications for a variety of embedded systems.

I have developed many embedded devices such as Video Streaming Device, wireless communication device, industrial controllers, Android Phones, Android STBs, Camera Encoders, RF card readers.

I have used many CPUs and SoCs from TI, Xilinx, Exynos, QualCom, Allwinner, HiSilicon, MediaTek, and Amlogic in my products.

During those days, I got a deep understanding of the CPU architecture system, peripheral interfaces, and the structure of the Linux system, and had the ability to develop any Linux programs and customize any part of the Linux system including driver development and bootloader.

Also, I’m familiar with video & audio codecs such as H.264, H.265, VP8, VP9, AAC, HEAAC, MP3, WAV **and** media format such as mp4, 3gpp, mkv, avi **and** streaming protocols like MPEG-DASH, RTSP, HLS, RTP.

While developing Video Streaming Device, Android Phones, Android STBs, I touched **AOSP** and **UBoot** and got familiarity in AOSP.

In terms of AOSP, I developed 4k video stream device. The input stream is RTP stream which contains MPEG-TS.

Video codec is H.265 and audio codec is aac. I used S905x3 from Amlogic as a processor. In my project, encoded video data was decoded using hardware accelerator in S905x3 and encoded audio data was decoded using libavcodec in ffmpeg library.

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Let me give you another example that I developed using **AOSP** RK3128

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Last year I participated in an industrial controller development project. One of my roles in that project was developing a module that automatically controls temperature of a working place using android embedded device. The android application should display the temperatures of multiple working places in real time and control the temperature automatically, So the application should send signal via GPIO to turn on and off the fans. Specifically, the application get input data via RS485 communication protocol and send output signal via PWM(pulse width modulation).

I developed GPIO driver

I updated the framework in order to push the UART data up to the application layer.

I updated HAL.

I updated Framework for letting the application to read and write data

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[Q] Why did you use android for this project.

Using android is the easiest way of developing applications with above functionalities.

**[Q] What is the difficult in that project.**

[Q] What kind of device driver did you develop before.

GPIO device driver, USD device driver (: developed a device and use USB for data communication)

[Q] firmware.

STM32f 407. developed a program for OLED.

While developing industrial controllers, I developed programs which is running on **RTOS**.

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Additionally, I will introduce my experience through one of the products I have developed.

Two years ago, I developed a Live Streaming Encoder using **TI's DM8169** processor.

This product is an embedded device for video streaming.

The product consists of video and audio input unit, encoding unit, and stream output unit.

The input unit receives digitized video and audio data through HDMI and SDI.

I developed the video and audio input driver in this part.

Throughout this work, I understood about HDMI and SDI protocols, and learned how to control ICs through I2C and SPI in the Linux driver layer.

The encoding unit encodes the input digital image and audio data.

Video encoding is performed using the hardware accelerator of the DM8169 processor, and audio encoding is performed using the DSP of the DM8169 processor.

DSP program for audio encoding was written separately.

While developing this program, I was familiar with the hardware accelerator driving method and the TI DSP program writing method.

The output unit performs the function of outputting the encoded bitstream data through UDP.

Overall, Working on this project, I mastered the following technologies.

- Writing Linux multithread programs

- How to develop Linux drivers

- Hardware accelerator driving method

- Understanding various low-speed and high-speed, serial and parallel communication protocols including I2C, SPI, UART, USB, Ethernet, HDMI, SDI

- Concept of RTOS

As you know, most embedded software has almost the same structure.

Therefore, I think I can meet your needs with the technology I currently have.

Practically, I developed various embedded programs in various embedded devices.

Next, I experienced how to collaborate with other members of the team.

In embedded software development, cooperation is especially important than general software development.

This is because embedded software works directly with hardware.

With these characteristics, the software supports the hardware and the hardware supports and helps the software to complete the development.

In addition, through the combination via interfaces between different modules, I experienced how to work together, such as providing interface and providing error codes.

What is important in my experience is a forward-looking attitude toward new technologies.

In today's constantly evolving competition, learning new technologies is the only way to survive.

I am always sensitive to new technologies and try my best to utilize them in product development.

Most importantly, I am passionate about embedded software development and take great pride in my work. I am always looking for ways to improve the quality of my code and the efficiency of my development process.

I believe that my skills and experience would be a valuable addition to your job, and I look forward to discussing this opportunity further with you. Thank you for your time and consideration.

# **[QUESTIONS]**

1) What would make someone successful in this role?

3) What is great about the team?

4) What could be improved on the team?

5) how would you describe the responsibilities of the position?

6) what are you looking for in a candidate?

7) What are the most immediate projects that I would take on?

# **[Tell my hope]**

I really appreciate your time today. This position and company sound ideal. I am really looking forward to hearing back from you on next step.

I’d like to show my skills via test project if you don’t mind.

# [Resume]

LA, California

**Jumio** 12/2021 – 05/2022

# [Common Questions]

I flied to Singapore several weeks ago. My parents got Covid and I decide to be with family members for a while. Now, I am planning to go back to the Los Angeles in 3 months. I am thinking that I could start work remotely right now, then I will be on board when I go back to LA.