

# Radar Embedded Engineer

## 담당 업무

As a highly skilled Embedded Software Expert, this role will lead the design and development of embedded software for our next-generation millimeter-wave (mmWave) radar systems. The successful candidate will work on firmware and algorithm implementation/optimization for a new RISC-V based chip, integrating RF frontend algorithms, optimizing post-processing performance, and enhancing computational acceleration techniques. This role requires expertise in embedded systems, low-level programming, hardware-software integration, and advanced algorithm optimization.

### Key Objectives:

- Develop, verify, and optimize embedded software for RISC-V based radar chips
- Implement RF frontend waveform configuration, FFT, interference suppression, and other signal processing algorithms in hardware accelerators
- Optimize post-processing algorithms (e.g., Extended Kalman Filter) for performance and resource efficiency
- Explore and deploy novel acceleration techniques utilizing hardware accelerators and assembly-level coding
- Design and implement high-speed multi-core shared memory schemes
- Troubleshoot and resolve low-level hardware/software integration issues
- Collaborate with hardware development and algorithm teams to align software solutions with hardware capabilities

### Task areasMain tasks\*

#### Hardware and Firmware Integration

- Develop firmware for controlling RF frontend and signal conditioning modules
- Configure and manage waveform generation and parameter adjustments
- Interface with hardware accelerators for waveform processing tasks

**Algorithm Implementation & Optimization** - Implement core RF algorithms such as FFT, interference suppression, noise filtering, and waveform configuration in hardware accelerators

- Optimize these algorithms for real-time performance on RISC-V architecture
- Adapt and fine-tune algorithm code to leverage HW accelerator features

#### Post-Processing and Algorithm Acceleration

- Develop efficient post-processing routines for target detection, tracking, and classification
- Accelerate computationally intensive algorithms like EKF using



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지사

**Jia Ding Qu**

리더십 레벨

**Leading People**

법률 고지

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dedicated hardware resources

- Explore assembly language optimization for critical routines to maximize performance gains
- Integrate hardware acceleration modules with software processing pipeline
- Deploy new acceleration scheme to optimize runtime critical operations, such as floating point calculation and matrix operation in RISC-V architecture

### **Parallel and Multi-core Programming**

- Design and implement high-speed multi-core shared memory schemes to maximize parallel processing efficiency
- Develop synchronization, data sharing, and memory access protocols for multi-core execution
- Ensure low-latency communication between cores for real-time operation

### **Software Optimization & Low-Level Troubleshooting**

- Profile and identify performance bottlenecks across software modules
- Fine-tune memory management, cache utilization, and data flow for optimized performance
- Troubleshoot and debug low-level issues arising from hardware-software interactions or embedded system constraints

### **System Validation & Testing**

- Develop test strategies for embedded firmware and algorithms
- Verify functionality against design specifications under various operating conditions
- Collaborate with hardware teams to diagnose and rectify hardware-related issues

### **Documentation & Collaboration**

- Maintain detailed technical documentation for firmware, algorithms, and system architecture
- Collaborate closely with hardware designers, algorithm developers, and system engineers
- Participate in design reviews, code reviews, and continuous improvement initiatives

지원자 프로필

**Education / Certification** Master's degree in Electrical Engineering, Computer Engineering, or related field

### **Professional Experience**

(Variety of Functions, Variety of Business, General Management Experience) - Strong experience in embedded firmware development in C/C++ and assembly

- Deep understanding of RF signal processing, radar systems, and related algorithms
- Proven expertise in multi-core programming and shared memory schemes

- Hands-on experience with RISC-V architecture and hardware accelerators
- Experience optimizing algorithms for embedded hardware resource constraints
- Familiarity with debugging tools, oscilloscopes, logic analyzers, and trace tools

### **Project and/or Process Experience**

Project management, PLC experience, Intellectual Property

**Leadership Experience** Leading engineering teams (functional, disciplinary)

처우 조건

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기업 소개

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