

RAVIKUMAR BALKUMAR

Bietigheim, Germany | +4915163720202 | kumraravi.87@gmail.com | [LinkedIn Profile](#)

PROFESSIONAL SUMMARY

Results-driven **Embedded Systems Lead** with 7+years of experience in **Embedded Software and Firmware Development**. Strong expertise in **Embedded C, RTOS, AUTOSAR, and real-time system design**. Adept at **debugging, memory optimization, and working with cross-functional teams** to deliver high-quality software solutions in **automotive and embedded domains**. Seeking a role to leverage my technical expertise in **Embedded Systems Development**.

TECHNICAL SKILLS

Programming Languages & Tools:

C, C++, Embedded C, Python, Assembly, MISRA C, Doors, MATLAB/Simulink, Git, SVN, JIRA, SysML, UML, CAPL, Integrity, Github, CI/CD, Clearcase, Jenkins, Yocto, Clearquest, Enterprise Architect, Rhapsody, Confluence, BareMetal, Lauterbach Trace32, Eclipse, STMCubeIDE, JTAG, GDB, Oscilloscope

Embedded Systems & RTOS:

RTOS (FreeRTOS, Linux, VxWorks), ThreadX, Linux Kernel, Multi-threading, Renesas RH850, Task Scheduling (SCHED_FIFO, SCHED_RR, SCHED_OTHER), Arm Cortex (M0, M4, A8), Infineon TC1797

Automotive & Communication Protocols:

SAEJ1939, CAN, LIN, SPI, I2C, UART, Ethernet (TCP/IP), UDS, ISO 26262, ISO 14229, Autosar (Classic & Adaptive), Vector CANoe, CANalyzer, Scrum, AGILE, SDLC V Model, Kanban, ASPICE

Memory & Optimization:

SRAM, EEPROM, Flash, DMA, ISR, Memory Fragmentation, Stack/Heap Optimization

WORK EXPERIENCE

System Engineer | Knorr Bremse AG | Schwieberdingen | [Aug 2022 – Present]

- Developed and maintained **system-level requirements and architecture** for **Front Looking Camera and Front Radar** in **automotive safety systems**.
- Designed **real-time task scheduling** strategies using **SCHED_FIFO, SCHED_RR, and SCHED_OTHER** for optimized system performance.
- Supported **customer and supplier workshops**, contributing to **End-of-Line (EOL) documentation, customer parameter specifications, and diagnostic specifications**.
- Collaborated on **multi-threaded embedded applications** using **RTOS (FreeRTOS, Linux, VxWorks), Infineon TC1797, and Renesas RH850**.

System Engineer | L&T Tech Services | Munich, Germany | [Jul 2019 – Jul 2022]

- Integrated DMA and ISR optimizations to enhance real-time data processing efficiency.

- Led **system-level component design and architecture** for **Application Software and Basic Software** in **Battery Management Systems (BMS)**.
- Implemented **communication protocols** (I2C, SPI, RS232, CAN) and **AUTOSAR stack modules** (DCM, DEM, COM) for **powertrain and battery systems**.
- Conducted **stack/heap memory optimizations** for **SRAM, EEPROM, Flash**, improving **system stability and performance**.

Embedded System Engineer | ZF Group | Shanghai, China | [Aug 2018 – Apr 2022]

- Developed **real-time AUTOSAR embedded applications** with **memory and power optimization techniques**.
- Worked on **low-level drivers and firmware development** for **infotainment and chassis control units**.

Senior Engineer | Valeo | Chennai, India | [Aug 2017 – Apr 2018]

- Provided **product maintenance and software updates** throughout the **product lifecycle**.
- Developed **bare-metal firmware** using **STMCubeMX, CubeIDE, Segger Embedded Ozone** for **real-time automotive applications**.

Senior Engineer | Lear Corporation | Pune, India | [May 2016 – Jul 2017]

- Conducted **research and development (R&D)** on **Body Control Modules (BCM)**, improving efficiency by **20%**.
- Implemented **memory fragmentation analysis and optimization** for **real-time embedded systems**. Utilized **JIRA and Python** for system automation and debugging.

Senior Engineer | Bosch | Coimbatore, India | [May 2011 – Apr 2016]

- Designed and implemented **embedded software solutions** for **Security Immobilizer and Powertrain Control Units**.
- Worked on **multi-threaded real-time applications** with **Linux Kernel and RTOS**.

EDUCATION

Bachelor of Engineering in Electronics & Communication | Anna University | 2009

CERTIFICATIONS & TRAINING

- Certified Generative AI MasterMind
 - RTOS & Embedded Linux Training
 - Certified Requirements Engineering
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LANGUAGES & LICENSE

English (Fluent) | German (Intermediate) | Führerschein Klasse B
