# Ankit **Kalbande**

EMBEDDED ENGINEER · SECURITY EXPERT

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## Summary

I am currently working as a 'Embedded Design and Security Engineer (Team Lead)' at EFR GmbH, Munich. I have more than 2 years of experience specializing in embedded Linux and bare-metal application development. I am Interested in devising a better problem-solving method for challenging tasks, and learning new technologies and tools if the need arises.

## Education

### TUM(Technical University of Munich)
MASTERS OF SCIENCE IN COMMUNICATION ENGINEERING

*Munich, Germany*
*Oct. 2013 - Oct. 2015*

- Embedded System and Security
- Wireless Sensor Network
- Network Planning
- Software Defined Networking
- System on Chip Design
- HW-SW Co-design System
- VLSI Design
- Electronic Design Automation
- Broadband Communication

### VNIT(Visvesvaraya National Institute of Technology)
BACHELOR OF TECHNOLOGY IN ELECTRONICS AND COMMUNICATION ENGINEERING

*Nagpur, India*
*Aug. 2009 - Sept. 2013*

- Digital and Analog Circuit Designing
- Embedded System
- Analog and Digital Communications
- Mobile Communication
- Network Planning
- Real-time Operating System

## Work Experience

### Europaische Funk-Rundsteuerung(EFR) GmbH
EMBEDDED DESIGN ENGINEER & SECURITY EXPERT (TEAM LEAD)

*Munich, Germany*
*Jun. 2016 - PRESENT*

- Designed BSI compliant secured software architecture for SMGW (Smart Meter Gateway).
- Implemented secured Linux boot workflow for Atmel's SAM5D35 MCU (ARM cortex A5).
- Integrated smart card with SMGW and ported crypto related functionalities to smart card.
- Developed RESTful API client to communicate with energy management server.
- Making the SMGW CC(Common Criteria) compliant (ISO/IEC 15408).
- *Tools* :- Openssl, Buildroot, Wireshark, Eclipse, CMake, Doxygen etc.
- *Protocol* :- ISO7816, Ethernet, TLS/SSL 1.2, HTTP, NTP, SOCKSV5 etc.
- *Platform* :- Atmel's SAM5D35 (ARM Cortex A5), Broadcom's BCM2837( ARM Cortex A53).

### Department for Integrated Systems, TUM
DIGITAL DESIGN AND RESEARCH ENGINEER

*Munich, Germany*
*Dec. 2015 - May. 2016*

- Ported the digital design from Chipit to ProFPGA hardware.
- Debugging the bugs in digital design of Network Adapter for InvasIC micro-architecture.
- *Tools* :- Synplify Pro, Chipitpro, Chipscope, Modelsim and grmon.
- *Protocol* :- AHB-AMBA, APB-AMBA.
- *Platform* :- Chipit (Xilinx Vertex-5), ProFPGA (Xilinx Vertex-7).

### Department for Real-Time Systems, TUM
EMBEDDED DESIGN WERKSTUDENT

*Munich, Germany*
*Aug. 2015 - Oct. 2015*

- Developed RSSI based local positioning system for BLE module NRF51822 using iBeacon.
- Integrated the developed module with existing modules on ARM cortex-M0+ of NRF51822.
- *Tools* :- GCC, Eclipse, Keil, NRF Studio, GDB etc.
- *Protocol* :- BLE 3.0 (Bluetooth Low Energy), iBeacon.
- *Platform* :- NRF51822 (ARM Cortex M0), iBeacon.

### Department for Integrated Systems, TUM
DIGITAL DESIGN WERKSTUDENT AND LAB TUTOR

*Munich, Germany*
*Nov. 2014 - Jul. 2015*

- Developed a new module for HW-SW Co-design lab and wrote the lab manual for the same.
- Developed a video processing accelerator on FPGA (Zynq-7000) and its software counterpart on ARM cortex-A9 processor.
- Modified Xillybus Linux driver to adapt with the application requirements.
- Lab tutor for HW-SW Co-design lab.
- *Tools* :- Vivado, ISE, Modelsim, GCC etc.
- *Protocol* :- Xillybus, AHB-AMBA, AXI-AMBA etc.
- *Platform* :- Xilinx Zynq-7000.

### Siemens (Corporate Research)

*Munich, Germany*

Wireless Research Werkstudent

*Jan. 2014 - Jun. 2015*

- Developed and implemented algorithm for motion sensing using RSSI values of Wi-Fi communication.
- Worked on distance measurement using time of arrival of Wi-Fi packets.
- Evaluated communication power of Atmel's Wi-Fi module.
- *Tools* :- Matlab, Wireshark, Tshark, GCC etc.
- *Protocol* :- IEEE 802.11 n (WiFi).

### Prespicas Wireless Solutions Pvt.Ltd

*Pune, India*

Bachlore Internship

*May. 2012 - Aug. 2012*

- Developed a web-socket (over GPRS) based firmware updating system for Atmega128.
- Developed a custom bootloader for ATmega128 and ATmega8.
- Integrated flow sensor using I2C and SPI interface with ATmega128.
- Setting up FreeRTOS on ATmega128.
- *Tools* :- Eclipse, GCC, Eagle.
- *Protocol* :- GPRS, I2C, SPI.
- *Platform* :- Atmel's ATmega128 and ATmega8.

## Project Experiance (Academic)

### Department for Integrated Systems, TUM

*Munich, Germany*

Cache coherency in multicore, multi-tile InvasIC architecture (Master Thesis)

*May. 2015 - Sept. 2015*

- Developed an IP core to establish coherency over the InvasIC micro-architecture using NoC.
- Performed all front end design related tasks.
- *Tools* :- ModelSim, Synplify(Synopsys), Vivado, GCC.
- *Protocol* :- AHB-AMBA, APB-AMBA.
- *Platform* :- Chipit (Xilinx Vertex-5).

### Department for Electronics and Communication Engineering, VNIT

*Nagpur, India*

RFID based health assistance & monitoring system (Bachelor Thesis)

*Aug. 2012 - Feb. 2013*

- Developed a smart glove to monitor the vital heath parameters and log the data on server.
- Developed an Android application for client side and web-application for server side.
- Hardware & software integration of temprature sensor and humidity sensor using I2C; and heartbeat sensor.
- Hardware & software integration of Bluetooth communication module using USART.
- *Tools* :- Netbean, Eclipse, GCC, Eagle.
- *Protocol* :- Bluetooth, I2C.
- *Platform* :- Atmel's ATmega 128.

## Skills

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|---|---|---|
| **Programming Skills** | • C, C++, Assembly<br>• Shell, Perl, Python Scripting<br>• MATLAB, Octave | • VHDL, Verilog, SystemC<br>• Android, JAVA<br>• Omnet++ |
| **Job-related Skills** | • Embedded Linux Development<br>• Embedded Security<br>• Embedded System Architecture | • Linux Kernel Module and Driver Development<br>• Network Architecture and Protocol Development<br>• Digital Designing and Verification |
| **Tools Skills** | • Buildroot, Yocto<br>• GCC, CMake, Automake<br>• Wireshark, Tshark | • Openssl, MbedTLS, OpenPGP, OpenSC<br>• Eclipse, Netbean, Keil, Dave<br>• Vivado, ISE, Modelsim, Synplify Pro |

## Publications

- Ankit Kalbande and Divyesh Dixit "Guardian Protocol for Mobile Wireless Sensor Networks" International Conference on Electronics, Communication and Computational Engineering(ICECCE 2014), Tamil Nadu, India.
- Ankit Kalbande, Divyesh Dixit and K.M Bhurchandi "RFID Based Health Assistance and Monitoring System through a Handmounted Embedded Device" IEEE 4th ICCCNT 2013,Tamil Nadu, India.
- Ankit Kalbande "Guardian Protocol for Wireless Sensor Networks" IEEE International Conference on Emerging Trends in Electronics, Communication and Networking 2012(Dec), SVNIT, Surat.
- Ankit Kalbande "Laser-based, Low cost and High Accuracy Local Positioning System (LPS)" ICECE(International Conference On Electronics and Communication Engineering ) 2012, Chennai.
- Ankit Kalbande, Divyesh Dixit, Prof. Eswar Rao "Optimized, Low cost and Low Power Flash ADC Design" National Conference for VLSI Design and Embedded System 2011, CEERI, Pilani.