Siddharth Kamath

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Embedded Firmware engineer with 10+ years of experience developing embedded software, device drivers, factory tools and algorithms for calibration, conformance and performance verification in the wireless communications industry.

Skills

Software: C, C++, Python, Embedded Software and Firmware, Device driver development, RTOS, Data Structures & Algorithms, CI/CD (Jenkins, Perforce, Git).

Hardware: Silicon and pre-silicon (FPGA) bring-ups, Register debugging using JTAG, Automation with GPIB and Ethernet, Cellular call processors, Signal generators, Spectrum analyzers, Oscilloscopes, Power meters, Temperature chambers.

Wireless Technologies: RF, 5G-NR (sub6 and millimeter wave), 4G LTE, 3G, IEEE 802.11.

Professional Experience

QUALCOMM TECHNOLOGIES INC. | NOV 2011- PRESENT

- **Drove multi-year development of embedded software and firmware** for cellular radio test in high volume mobile device production with focus on complex modem calibration algorithms and performance verification for 3GPP specification compliance.
- Led cross functional teams responsible to provide **board bring-up and factory support in China for Apple's iPhone and iPad product-lines** for 6+ years with focus on reducing factory costs and production time.
- Quickly bootstrapped automation to accelerate **5G development efforts for equipment vendors (Anritsu, Keysight, Rohde&Schwarz**) and OEMs by implementing **beam characterization algorithms** and test automation drivers ensuring fastest time to market in the industry.
- **Managed weekly scrums of 10-20 stakeholders** to develop customer requested features and debug high-priority factory blocking issues, ensuring timely delivery.

SENIOR STAFF RF SOFTWARE ENGINEER | NOV 2022 - PRESENT

- Most recently led the calibration and performance verification team which resulted in successful launch of Qualcomm's **Femtocell Station Modem (FSM) product** with 5G millimeter wave (mmW) bands support and a **revenue pipeline of over $5 billion**.
- Developed a highly optimized phase calibration solution for Qualcomm's commercially available mmW based **Customer Premises Equipment (CPE) product** which enabled forming beams across multiple planar antenna array modules.
- **Developed and filed a patent** for training path search algorithm for the **first mmW Digital Pre-distortion calibration solution** on Qualcomm chipsets which **doubled the cellular range** for devices operating in the millimeter wave band spectrum.

STAFF RF SOFTWARE ENGINEER | OCT 2017 - NOV 2022

- Successfully delivered Qualcomm's commercially available **mmW beam characterization, design and codebook generation solution which has been utilized in ~250 million 5G chipsets shipped to date**.

- Developed Qualcomm's **self-calibration solution** for GSM bands which reduced the need for external test equipment resulting in **factory lead time savings of over 15% and $50MM cost savings for 100+ customers**.
- Designed and delivered a compressed diagnostic packet sequence solution for Qualcomm's Sequencer test platform (QSEQ) using the zlib compression library which **saved ~4000 milli seconds in test time per device during mass production resulting in $100MM+ in operational cost savings for high volume OEM customers**.

SENIOR RF SOFTWARE ENGINEER | JULY 2014 - OCT 2017

- Worked extensively with Qualcomm systems engineering to replace a slow reduced signaling solution for determining receiver sensitivity by developing an **IQ capture based factory solution which delivered an average test time savings of over 90%.**
- **Developed and delivered the QMatch tool** which enabled customers to verify and optimize their impedance matching process resulting in quicker performance evaluation of RF front end components.
- Developed characterization modules which are part of Qualcomm's **Envelope Power Tracking solution suite which resulted in battery power savings and cellular talk-time increase of over 40%**.

RF SOFTWARE ENGINEER | NOV 2011 - JULY 2014

- Developed and documented **Qualcomm's Manufacturing Support Library (QMSL) APIs for the Factory Test Mode (FTM) verification platform** which is a quicker way to perform conformance testing for high volume production.

Education

Master's in Electrical Engineering - UNC Charlotte - 2011
Bachelor's in Electronics Engineering - University of Mumbai - 2007

Patents and Publications

- **Patent # US11764888B2 (Granted) - Beam Characterization:** Design procedure using mmW electric field data of antenna array elements to compute and store phase and amplitude weights in a proprietary codebook format needed for forming directional beams.
- **Patent # US11671846B2 (Granted) - Adjacent Beam Determination:** Use beam-forming gain and coverage area information to figure out an optimal set of serving beams in cases of coverage holes.
- **Patent pending #18/323286 -** Training path search algorithm for mmW digital pre-distortion calibration.
- **Publication**: "Integrated Load Balanced and Energy Aware Routing In Large Scale Wireless Sensor Networks", Proceedings of the 30th IEEE International Performance Computing and Communications Conference (IEEE IPCCC 2011), Orlando, FL, November 17 - 19, 2011.