Avijit Das

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Professional Summary

Principal Software Engineer with 16+ years of expertise in medical devices, mobile platforms, and embedded systems. Demonstrated leadership in developing life-critical medical device software at Medtronic, with specialized proficiency in C/C++, Linux kernel development, and Android framework optimization. Proven success at Qualcomm advancing Snapdragon platform security and performance. Core competencies include system-level debugging, performance optimization, and cross-functional technical leadership.

Professional Experience

Principal Software Engineer **Dec 2021 – Present**
Medtronic *Boulder, CO*

- Lead software development for life-critical endotracheal intubation medical devices, architecting respiratory algorithms and safety features in C++ that directly impact patient outcomes
- Engineer intuitive GUI interfaces optimizing clinical data presentation for healthcare professionals, balancing complex information display with operational simplicity under high-stress conditions
- Architect end-to-end connectivity solutions enabling remote ventilator access, cloud data synchronization, and over-the-air software updates while maintaining strict medical device security standards
- Develop real-time patient monitoring systems with Ethernet-based data collection and continuous vital sign tracking, ensuring sub-second latency for critical parameters
- Design and implement packet tracking debugging tools for manufacturing validation, reducing integration defects by 35% and accelerating quality assurance processes
- Manage enterprise-scale medical device codebase using Git, establishing branching strategies and code review workflows ensuring FDA regulatory compliance

Senior Software Engineer **Nov 2015 – Dec 2021**
Medtronic *Carlsbad, CA*

- Developed embedded software for ICU ventilator systems, implementing advanced breathing technology algorithms in C++ for critical care applications
- Designed comprehensive GUI frameworks for medical device displays, achieving optimal balance between clinical data presentation and user experience
- Built secure connectivity device software for remote ventilator monitoring, implementing HIPAA-compliant data collection and cloud synchronization
- Engineered patient monitoring capabilities with real-time data visualization, maintaining sub-second response times for life-critical parameters
- Created automated debugging tools for manufacturing validation, improving quality assurance efficiency and reducing defect detection time

Senior Software Engineer **Apr 2013 – Nov 2015**
Qualcomm Inc. *San Diego, CA*

- Led SELinux/SEAndroid enablement on Snapdragon platforms for Android Lollipop and Marshmallow, architecting and enforcing comprehensive security policies across system services
- Designed and implemented Crash on Denial framework for sepolicy violation auditing, significantly enhancing security posture across OEM device deployments
- Achieved 20% boot time optimization during SEAndroid implementation, addressing critical OEM performance requirements while maintaining security standards
- Contributed to open source security framework development and collaborated with Android security community (contributions: avijitnsec@codeaurora.org)
- Ported Trinity Linux system call fuzzer to Snapdragon architecture for comprehensive security vulnerability detection, identifying and resolving multiple critical exploits
- Developed suite of vulnerability detection tools for stack, heap, data, and code analysis, strengthening platform security testing capabilities
- Debugged complex Linux kernel issues and implemented kmemleak support to systematically track and resolve memory leaks across kernel subsystems
- Analyzed and resolved critical Android framework issues including stability and security vulnerabilities, collaborating directly with Google engineering teams

- Triaged high-priority issues across core Android subsystems: SurfaceFlinger, Camera, Telephony, Audio, and Video frameworks
- Provided expert technical support to OEM partners, resolving launch-blocking issues and ensuring on-schedule product releases

Software Engineer **May 2012 – Apr 2013**
STMicroelectronics *Greater San Diego Area*

- Developed display drivers in command and video modes for NovaThor platform, implementing DebugFS support for enhanced kernel-level debugging
- Led Android OS porting to Orly platform for set-top box applications, ensuring hardware compatibility and performance optimization
- Provided critical onsite technical support to HTC for display subsystem issues, resolving launch-blocking problems

Software Engineer **Jun 2010 – May 2012**
Sasken Communication Technologies Ltd *Bengaluru, India*

- Successfully ported Android OS to Texas Instruments OMAP 3630 and 4430 platforms, optimizing for platform-specific hardware capabilities
- Developed RTOS and RTS frameworks for DAVINCI and DAVINCIHD boards in C, implementing efficient real-time task scheduling
- Profiled and optimized ION memory management in Android ICS, enabling successful ICS deployment on resource-constrained 512 MB RAM devices

Technical Skills

Programming Languages: C, C++, Python, Perl, Shell Scripting, PHP
Operating Systems: Linux Kernel, Unix, RTOS, Android (Lollipop, Marshmallow, ICS)
Embedded Systems: ARM Architecture, Snapdragon SoC, OMAP, NovaThor, Device Drivers, BSP Development
Android Framework: SurfaceFlinger, Camera HAL, Telephony, Audio/Video, SELinux/SEAndroid, ION Memory
Development Tools: Git, GDB, DDMS, Trace32, kmemleak, DebugFS, Stack Trace Analysis, Fuzzing
Domain Expertise: Medical Device Software (FDA Compliance), Security Engineering, Performance Optimization
Engineering Practices: Code Review, Agile Development, Cross-functional Leadership, Open Source Contribution

Education

Bachelor of Technology in Computer Science and Engineering **2005 – 2009**
West Bengal University of Technology *Kolkata, India*

Certifications & Awards

Machine Learning Specialization: Supervised Learning, Unsupervised Learning, Advanced Learning Algorithms
Deep Learning: PyTorch for Deep Learning
Recognition: Qualstar Award (Qualcomm)