# Ajay Harikumar

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## Objective

Use my diverse technical skills and business acumen to make impactful change using technology. Looking for senior positions in startups. I prefer working on Python/R and Go-lang.
Green card/authorized to work in US.

## Skills

18 years Software Engineering experience including Architecture, Design, Software development, Product Ownership, Building Teams, new Project/Business proposals.

Five patents, IDF in pipeline, external and internal papers.
(https://scholar.google.com/citations?user=eNafY6MAAAAJ&hl=en)

**Skill Matrix**

| | | |
|---|---|---|
| Expert | **C, Systems, Runtime** | Binary translation, BIOS, Simulators, Performance analysis and Optimizations |
| Good | **Python**, Algorithms/Data structures, x86 assembly | Code optimizations and Computer Architecture |
| Previous work experience | C++, Android system and app development, R | Virtualization, EFI |
| Personal projects | **Go-Lang**, HTML5<br>R, Python | Web backend<br>Quantitative Analysis |
| Soft skills | Highly results oriented, mentoring, idea generator, diverse technical and business interests | |

## Education

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|---|---|---|---|
| **MS in Software Systems** | BITS Pilani, India. | 74% (~3.4 CGPA) | 2005-07 |
| **B.Tech in Electrical and Electronics** | Kerala University, India | 75% (~3.5 CGPA) | 1992-96 |

## Experience

| | | |
|---|---|---|
| **Staff Software Engineer** | **Intel Software group**<br><br>(2012 to present) | **Binary Translation** (BT)– Team leader in BT runtime team; Developed critical modules (dynamic lookup tables, translation cache management), analyzed and improved performance (graph search for finding garbage collection items, fix thread contention issues) for various Binary Translation projects (C Lang, Python, R).<br>**- Security BT:** Control Flow Integrity (CFI) protection against malware attacks like ROP and Stack Pivoting on Windows, **used by McAfee for zero-day attack identification** and feeding into their virus definitions. Personally responsible **for 2X speedup and 50% memory reduction (Division award**) enabling faster malware detection and avoiding browser timeouts. Created **performance framework** for identifying complex bottlenecks (**Division Award**).<br>**- Android**: Owned and enabled Security BT on Android. (Identified Android security weaknesses and possible mitigations).<br>**- Processor BT**: Critical project with Processor Architects on a h/w-s/w co-design project to increase processor performance using BT. |
| **Platform Architect** | **Intel Mobile and Tablet group** | Owned Tablet/Phone system performance in Platform Arch team. Developed complex performance models (CPU, Gfx, and Memory) for Intel and competitive platforms to meet requirements like Windows 8 WHCR PerfX and requirements for 1080p. More than **50 million tablets that I have worked on**, have been sold (meeting Key Perf Indicators). |

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|---|---|---|
| | (2009 to 2012) | Developed SDV (Software Dev. Vehicle) for graphics driver development modifying a Qemu VMM and connecting to FPGA through bus functional models. Extended for other IPs. Successfully rendered images using extremely complex flow between App/Driver←→VMM←→BFM←→IP (Verilog-FPGA). |
| Senior Research Scientist | **Intel Labs** (2005-2008) | Architected and prototyped (in C and using VMM simulator)<br>1. "**Platform Partitioning**", prototyping running two simultaneous OS on a single server without VMMs or Virtualization.<br>2. **OS integrity check** rooted in hardware (new instructions for checks). |
| Senior Software Engineer | **Intel Server group** (2002-2005) | **Owned and released BIOS** (UEFI, C) **for several Intel Servers generations** from 2003 to 2006. This included developing features like ACPI, Processor and Server Management features and coordinating with various h/w and s/w teams for releasing the BIOS for production. Developed several Server Management (SM) features (Error logging, RAS and memory features, UEFI driver for SM chip). |
| Senior Software Engineer | **Virtio** (Synopsis) (2000-2001) | Provided enhancements (watch windows and variable logging using Windows DbgAPI) for Virtio Innovator, a tool to (drag-and-drop IPs and) create platforms and run simulations. Company was a **startup** spun off of National Semi and later acquired by Synopsis. |
| Senior Software Engineer | **Philips** (1999-2000) | Developed bit/cycle accurate, behavioral and functional simulation models of Processors including MIPS and DSP (C/C++ and Linux). |
| Software Engineer | **Accord** (1997-1999) | HP: Developed **Automotive software** (for Ford/Mazda cars) (C/ASM).<br>Defense: Develop and test mission critical **Avionics** software for Light Combat Aircraft (ADA and i386).<br>Started a Bug Tracking System (20% project) that evolved to a very successful Project Management and Tracking product.<br>http://www.accord-soft.com/smart_work.html |

## Links

LinkedIn: http://linkedin.com/in/ajayharikumar (more details on projects)
Web: http://ajayharikumar.com
Github: https://github.com/ajayhk

## References

Available on request

## Other activities

- **Reviewer and contributor** to Intel's biggest Tech conf (**DTTC**), reviewer and organizer for **HIPC**
- **5 patents, one external paper (VDAT 2000) and four internal papers**
- **Conceptualized and conducted site wide Innovation Contest**. Over 170 teams participated with winner getting funding for prototyping and project (**Site level award**)
- **Expert at "Meet the Experts" at Intel Developer Forum (IDF) 2005**
- Industry talk at HiPC 2010
- Ideas (Personal Web Server etc.) **always in top quartile** in Ideation contests
- Volunteer at Sacred Hearts, active in zidisha.org and other charitable organizations
- Conceptualized, got funding and started extremely popular site-wide PC gaming room and chapter
- **Quantitative Analysis – Using R and Python**, developed stock trading algorithms, traded actual money; **ranked 17th best performance** among 300 entries at www.quantopian.com