Bala
@0xba1a

Architect of an AI-agent framework capable of autonomous coding, debugging, and large-scale log analysis, powering solutions such as AI-driven patch backporting and CI/CD failure diagnostics for Azure Linux. **Designing and building context-aware AI agents** for complex engineering workflows. Expert in Linux systems, cloud infrastructure, kernel development, and performance optimization.
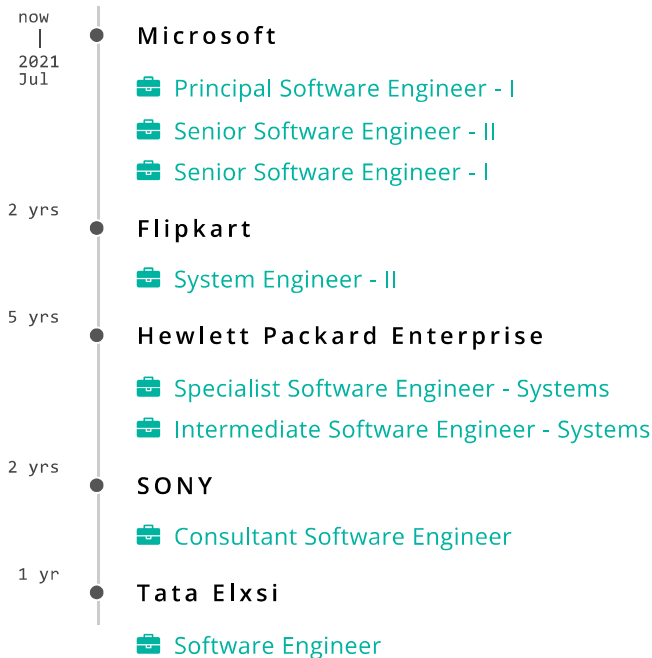
kumaran.4353@gmail.com ✉

+91 7406479544 📞

Bangalore, IN 📍

github.com/0xba1a 🔘

www.eastrivervillage.com 🌐

💼 Work Experience

now
|
2021
Jul

Microsoft

- 💼 Principal Software Engineer - I
- 💼 Senior Software Engineer - II
- 💼 Senior Software Engineer - I

2 yrs

Flipkart

- 💼 System Engineer - II

5 yrs

Hewlett Packard Enterprise

- 💼 Specialist Software Engineer - Systems
- 💼 Intermediate Software Engineer - Systems

2 yrs

SONY

- 💼 Consultant Software Engineer

1 yr

Tata Elxsi

- 💼 Software Engineer

🏆 Patents

- US10862859B2
- US11349653B2
- US20220214905A1
- Common IP based network communication between virtual machine and host - Application Awaiting Examination

🔧 Skills

AI Agents Python A2A MCP ACP Linux

👍 Work Highlights

Microsoft

- Develop Microbots - an AI agent library
- Architect a multi-agent system for Patch Backporting. Multi-agent orchestration using A2A and ACP
- Research compiler technologies to develop tools for context-aware AI agents
- Maintain stability and security of Azure Linux as stable maintainer
- End-toEnd automation of Azure-Linux release process - an orchestration for 200+ pipelines maintained by 10+ teams spawned across 2 Geos. Introduced AI driven failure analysis and hot-fixes

Flipkart

- Develop the core telemetry system that collects critical system metrics every second on every single VM and baremetal across three Geo separated datacenters
- Automate baremetal life-cycle - Verify, Prepare, Onboard, Monitor, Deprecate and Sunset
- Analyze performance impact of L3-cache on VMs
- Develop virtualization orchestrator - proprietary software similar to cloud-hypervisor

Balakumaran Kannan
Principal Software Engineer

kumaran.4353@gmail.com ✉

+91 7406479544 ☎

📂 Projects

AI Agent development

Now | 2024 Feb

💼 Microsoft   📍 Bangalore

- Developing Microbots, a Python framework for building AI Agents
- Developing a complex multi-agent system for patch backporting Microbots with A2A
- Customized SWE-agent to automate CVE backporting CVE patches.
  Contributed back to the open-source project.
- Developing proprietary tools that enhance LLMs with contextual awareness for large-scale codebases such as Windows, Linux kernel, etc.,.
- Accelerating automation workflows by resolving bottlenecks using AI solutions

Azure Linux Development

Now | 2021 Jul

💼 Microsoft   📍 Bangalore

- Serve as stable maintainer for Azure Linux, ensuring stability, security, and feature development.
- Architect and lead teams responsible for security automation and release management systems.
- Release systems automate daily, weekly, monthly, and fast-track testing and deployment pipelines, including in-house alerting, dashboards, and an AI-powered failure triage platform.
- Security automation includes scanning NVD for vulnerabilities, patching affected packages, and automating pull requests.
- Designed and implemented these systems, driving **Azure Linux adoption from 300K to 24M cores** over five years.

Utilization metric collector - Minute level granularity

Now | 2020 Jun

💼 Flipkart   📍 Bangalore

- Collect CPU, Memory, Network and Disk utilization every minute from 70K+ VMs and 30K+ BMs across 2 DCs
- Architectured the project end-to-end from design to delivery
- Developed a new method for VM-Host communication and patented it

Performance evaluation of virtual L3-cache

2020 May | 2020 Mar

💼 Flipkart   📍 Bangalore

- Investigated the effects of exposing L3-cache details to virtual machines on overall performance
- Measured IPI (InterProcessor Interrupt) and VM_EXIT overheads associated with L3-cache exposure
- Utilized perf and perf-kvm to assess Linux scheduler behavior after schedule domain modifications
- Benchmarked using schbench, sysbench, fio, and NAS-PB to quantify performance changes
- Identified an approximate 8% reduction in performance for scheduler-intensive workloads

Linux OS development for ARM & ARM64

Now | 2017 May

💼 Hewlett Packard Enterprise   📍 Bangalore

- Brought up two boards: an ARM64-based SoC (NXP) and an in-house ARM32 SoC
- Prepared a custom Linux distribution using Yocto, including kernel configuration, userland package selection, and device-tree management
- Updated syscon-reboot driver for DDR self-refresh
- Enabled D-cache in kexec purgatory to optimize boot time
- Designed and implemented a core-dump capture system via NFS

Bootloader development for ARM32

Now | 2018 Sep

💼 Hewlett Packard Enterprise   📍 Bangalore

- Developed First Stage Loader (FSL) for the in-house build ARM32 platform
- U-boot is configured, built and kept as an integral part of FSL
- After console and DRAM initialization, control will be given to u-boot
- Worked closely with hardware team for DRAM initialization sequence and BIST enablement

📂 Projects

2017 May | 2014 Aug

HA/RFS module development

💼 Hewlett Packard Enterprise   📍 Bangalore

- Owner of High-Availability [HA] and Redundant File System [RFS] modules for a range of HPE procurve switches
- Played a key role in the core-team that developed Front Plane Stacking [FPS] switches
- Re-architectured HA/RFS modules to make it work seamless in both BPS and FPS environment
- Participated in complete development cycle - Design, Develop, Test and Maintenance

2014 Aug | 2013 Apr

Preparation of SONY Linux

💼 SONY   📍 Bangalore

- Part of a team that developed a Linux distribution for SONY devices
- Ported open source network packages like Curl, OpenSSL, Squid, IPSEC tools
- Performed IPv6 Ready Logo tests with TAHI test framework
- Identified bugs with Linux kernel. Contributed fixes to kernel community

2013 Mar | 2012 May

Networking library development

💼 SONY   📍 Bangalore

- Developed a network library with wired and wireless support
- It was used in SONY TVs and Blueray DVD players and are still in use
- Participated in all phases of development cycle

2012 May | 2011 Jun

Application development for connected devices

💼 Tata Elxsi   📍 Coimbatore

- Developed two prototype applications - BigFlix and Flikr - on Samsung Smart TV, Panasonic VIErA connect TV, ROKU and BOXEE streaming player

🎓 Education

2011 | 2007

B.E., Computer Science & Engineering

🏛 Jeppiaar Engg. College   📍 Chennai

🔖 72%

2007 | 2005

Higher Secondary Education

🏛 SRV Higher Secondary School   📍 Namakkal

🔖 92.6%

2005 | 2003

SSLC

🏛 Govt. Higher Secondary School   📍 Pattukkottai

🔖 93%