Om Prakash Singh

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Professional Summary

Software Engineer with 7+ years of specialized experience in AI/ML system validation, firmware development, and test automation across Microsoft, Intel, and LT Technology Services. Expert in building scalable validation frameworks for next-generation AI features, with proven track record of reducing test execution time by 40system-level validation, having contributed to Copilot+ PCs and Windows Studio Effects. Recognized for driving engineering velocity through innovative tooling, infrastructure improvements, and end-to-end ownership of complex cross-platform integrations.

Experience

Software Engineer 2 (Device Validation) *Hyderabad, India*
Microsoft *June 2024 – Present*

- Developed PowerShell-based test automation frameworks for validating AI camera features in Windows Studio Effects on Intel, AMD, and QNN IHVs, supporting millions of Copilot+ PC users
- Reduced test suite run time by 40% through dynamic synchronization and optimization of execution logic, saving 15+ hours weekly across validation cycles
- Led validation for WSE v1 releases across LNL, STRX, and Cadmus platforms; authored comprehensive infra-setup guides adopted by 3 validation teams
- Built EdgeOptimizer, an AI agent to track on-device model power usage and CPU/NPU utilization, enabling real-time performance monitoring for Windows AI workloads
- Implemented semaphore-based synchronization, enabling concurrent multi-model execution across test applications while maintaining resource isolation
- Performed deep concurrency profiling using WPR/WPA traces, identifying and resolving timing bottlenecks, resource contention, and execution gaps in AI model pipelines
- Contributed to Copilot+ PCs by building new API-level model validation pipelines and fixing 15+ critical issues across IHV integration, ensuring seamless user experience
- Integrated and shipped content moderation capability into Phi models used in Copilot, enhancing AI safety and compliance across Microsoft's AI ecosystem
- Enhanced code coverage by 25% and reliability by integrating AppVerifier into CI flows, reducing production bugs in device validation workflows
- Owned PS API test pipeline, added cache validation layers, and independently triaged 20+ issues across 10+ release cycles, maintaining 99% pipeline reliability

Emulation Engineer (Pre-Silicon Validation) *Bangalore, India*
Intel *July 2021 – June 2024*

- Owned firmware integration for ADR (Asynchronous DRAM Refresh) flow in the CXL interface and low-power entry/exit scenarios across Xeon platforms
- Developed 10+ PCIe Gen6 transactor enhancements in C++ and debugged integration with testbench flows
- Created and maintained Perspec-based test content for reset and power management validations, improving test reuse and automation
- Validated idle PM and reset flows, ensuring early bug capture across emulation stages with Simics and Zebu platforms
- Diagnosed and triaged 15+ cross-IP bugs involving silicon interface failures, platform timeouts and firmware issues
- Contributed to a 25% reduction in post-silicon bugs by improving validation coverage and speeding up triage by using AI tools

Software Engineer *Bangalore, India*
L&T Technology Services *Sep 2018 – July 2021*

- Designed and implemented a modular test automation suite in Python for thermal and power management

of NVMe-based storage platforms
- Developed 25+ test scenarios to evaluate power states, thermal thresholds, and firmware transitions under dynamic workloads
- Conducted post-silicon debugging using JTAG and Metaware, analyzing register maps and firmware traces for system-level failures
- Performed NVMe 1.3 protocol validation using Lecroy analyzers, OakGate, and Exercisers, ensuring spec compliance across firmware revisions
- Collaborated with FW and validation teams to resolve 10+ power-related issues

Key Projects

- **EdgeOptimizer AI Agent** (Microsoft, 2024-2025) – Developed an intelligent monitoring system to track on-device model power usage and CPU/NPU utilization across Windows Studio Effects, enabling real-time performance optimization and resource management for AI workloads
- **Copilot+ PC Validation Infrastructure** (Microsoft, 2024) – Built comprehensive API-level model validation pipelines for Copilot+ PCs, ensuring seamless integration across Intel, AMD, and QNN IHVs while resolving critical compatibility issues
- **CXL Firmware Integration Platform** (Intel, 2021-2024) – Owned end-to-end firmware integration for Asynchronous DRAM Refresh (ADR) flows in CXL interface, covering low-power scenarios and reset management across Xeon server platforms
- **NVMe Thermal Management Suite** (L&T Technology Services/SanDisk, 2018-2021) – Designed and implemented modular Python-based automation framework for thermal and power management validation of NVMe storage platforms, covering 25+ test scenarios and firmware transition states

Education

- **M.Tech in Computer Science & Engineering**, National Institute of Technology, Durgapur – 2018
- **B.Tech in Computer Science & Engineering**, RGPV, Bhopal – 2015

Technical Skills

- **Programming Languages:** Python, PowerShell, C, C++, Perl, Shell Scripting
- **AI/ML Frameworks:** ONNX Runtime, DirectML, TensorFlow, PyTorch, Phi Models, Content Moderation APIs
- **Development Areas:** Firmware Development, Test Automation, System Validation, Performance Optimization, API Integration
- **Tools & Platforms:** JTAG, WinDbg, WPR/WPA, Metaware, VS Code, AppVerifier, Simics, Zebu, Lecroy Analyzers
- **System Technologies:** Windows Internals, PCIe, CXL, NVMe, SOC Architecture, Power Management, Concurrency Profiling
- **Domain Expertise:** LLM Integration, Agentic AI, Pre-Silicon Validation, Device Validation, Storage Protocols
- **Version Control & CI/CD:** Git, GitHub, PowerShell-based CI flows, Automated Testing Pipelines

Awards & Recognition

- **Microsoft**
  - **Jan 2025** – Recognized for performance optimization efforts that reduced test execution time by ˜40%
  - **Sep 2024** – Awarded for building and setting up validation infrastructure for Copilot+ PCs
- **Intel**
  - Received 'Star of the Month' for early bug discovery and validation of CXL firmware flows
- **L&T Technology Services (Client: SanDisk)**
  - Awarded Spot Awards for SDExpress POC validation in power/reset flows (Client: SanDisk)