

Harsh Verma (he/him)

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SUMMARY

Backend and full stack developer focused on server side systems and developer tooling. Builds Django and Firebase backends behind Android apps, and a Rust language server and build system for STM32 firmware. As an active GNOME contributor, writes unit testing frameworks for GIMP and tightens its CI pipelines. Works day to day in Python, Rust, C++, and Kotlin on Linux. Also contributed to gnome/gtk, gnome/gegl, and meson/meson.

EDUCATION

- **National Institute Of Technology** Hamirpur, India
Bachelor of Technology - Electrical Engineering *July 2024 - May 2028 (Expected)*

TECHNICAL SKILLS

- **Languages:** Python, Rust, C++, Kotlin, SQL, Bash
- **Backend & Databases:** Django, Firebase (Auth, Realtime DB, Firestore), MySQL, REST APIs, WebSocket
- **Developer Tooling:** CLI Design, LSP / Language Servers, CMake, Unit Testing, dogtail, AT-SPI
- **Automation & DevOps:** GitHub Actions, GitLab CI/CD, GitHub API, Git & GitHub, Linux
- **Mobile:** Android (Kotlin, Jetpack Compose, Navigation)
- **Hardware (Basic):** Embedded Systems, PCB Design

OPEN SOURCE EXPERIENCE

- **GNOME** [GitLab \(@harshverma\)](#)
Active Contributor *February '26 - Present*
 - **Featured Contributor - GIMP:** Earned recognition in the official [GIMP GSoC 2026 Midpoint Progress](#) blog post for Wayland UI test automation, CI-Fairy commit-format integration, and About dialog improvements.
 - **End-to-End UI Testing - GIMP:** Built *12 end-to-end UI tests* that drive real GIMP windows through the accessibility tree on a headless Wayland session, integrated into GitLab CI, an approach not previously attempted for the project.
 - **[CVE-2026-97185](#) (CVSS 7.8) - GIMP:** Found an out-of-bounds write in the GIMPpressionist plug-in's preset loader, where unvalidated vector indices from untrusted preset files could corrupt fixed-size arrays, affecting RHEL 7 through 10. *Credited by Red Hat.*
 - **[CVE-2026-90947](#) (CVSS 7.8) - GIMP:** Hardened the lighting plug-in's preset loader against a buffer overflow, clamping an unvalidated light count read from untrusted preset files before it could write past the fixed-size array. *Credited by Red Hat.*
 - **Unit Testing - GIMP:** Engineered a Unit Testing Framework from scratch for core GIMP libraries, *covering 15+ files*; integrated the suite into GitLab CI/CD pipelines for automated validation on every commit, and detected a previously unnoticed environment-variable bug through test analysis.
 - **About Dialog - GIMP:** Added a version-information display to the About dialog with a one-click copy button, giving users and bug reporters an exact snapshot of build and environment details.
 - **CI Optimization - BABL & GEGL:** Diagnosed a GitLab CI flaw that let a single commit spawn two parallel pipelines and authored the fix, *cutting CI resource usage by 50%*.
 - **Commit Log Validation - GIMP:** Authored a check-commit-log CI job that validates commit titles and descriptions on pull requests, enforcing project commit-message standards across every merge request.
- **dogtail - GUI Test Automation Framework (under Red Hat)** [MR \(dogtail\)](#)
Contributor *August '26 - Present*
 - **v2.1.0 Release:** Delivered the new hermetic package as the headline feature of the upstream *dogtail 2.1.0* release (August '26).
 - **Hermetic Test Sessions:** Engineered a hermetic package that runs the framework's UI tests with no desktop session, bringing up a private D-Bus, at-spi2-registryd, and headless Mutter on demand with input via Mutter's RemoteDesktop API, so tests run in CI where GNOME Shell is unavailable. Submitted upstream across *14 files*.

PROJECTS

- [Nucleus](#) - *A CLI-first developer platform for STM32 (v0.2.0 released, [YouTube](#))*: Engineered a CLI-first alternative to STM32CubeIDE, a *9-crate Rust workspace* that replaces a *3 GB* Eclipse IDE with a *10 MB* binary. Stored hardware config in a version-controlled `stm32.toml`, validated by a constraint solver across pin/AF conflicts, clock-tree legality, DMA stream arbitration, and NVIC priority. Built a dual-backend HIL test runner against QEMU and real silicon over SWD, plus a lockstep mode that reports the first point where sim and silicon ITM traces diverge. Also authored an LSP server for live conflict diagnostics and a CoreSight trace daemon streaming over WebSocket to a real-time React dashboard, with a thin VS Code display extension.
Tech Stack: Rust, TypeScript, CMake, WebSocket, OpenOCD, QEMU
- [Kissan-Connect](#) - *An Android-based marketplace app for farmers*: Developed an Android marketplace app that connects farmers directly with consumers. Built the backend on Django for core application logic and the Android client's API, with Firebase handling authentication, storage, and product listings.
Tech Stack: Python, Django, Firebase, Kotlin, Jetpack Compose
- [AyurGyanam](#) - *An Android app dedicated to herbal health*: Built a full-stack Android application focused on herbal health and Ayurveda. Designed a Django backend to handle requests such as plant information, symptom-based responses, and chatbot queries, and integrated Firebase Authentication and database support for user login and bookmarked plants. Structured the backend endpoints, request and response flow, and secure handling of user-specific data.
Tech Stack: Python, Django, Firebase, Kotlin, Jetpack
- [Network-Level Ad Blocking System](#) - *A custom DNS server with ad filtering*: Implemented a network-wide ad blocker with a custom DNS server written in Python. Configured all connected devices to route DNS queries through the server, blocking unwanted domains before they resolve. Programmed the request handling and DNS filtering logic, and installed the server as a persistent Linux service.
Tech Stack: Python, Raspberry Pi, DNS, Linux

VOLUNTEERING EXPERIENCE

- **HackerRank Campus Crew - NITH**
Ambassador *November '25 - Present*
 - **CodeRank Competition**: Organized a competitive coding event for *100+ participants* at NIT Hamirpur to grow the campus coding community.
- **Society for Promotion of Electronics Culture (SPEC) - NITH**
Technical Lead *August '26 - Present*
 - **Breakout Brigade 5.0**: Led a hands-on hardware workshop for *300+ freshers* at NIT Hamirpur, guiding first-year students through practical electronics.
- *Executive* *August '25 - May '26*
 - **Electrothon 8.0**: Managed the 8th iteration of an MLH-backed hackathon for *500+ students* across multiple colleges, overseeing technical and administrative logistics end to end.
 - **Breakout Brigade 4.0**: Directed a hands-on hardware workshop for *120+ junior students* at NIT Hamirpur; attendees rated it the best of the four workshops held.
- *Volunteer* *September '24 - May '25*
 - **Electrothon 7.0**: Organized an MLH-backed hackathon with *2500+ registrations*, coordinating accommodation, catering, and venue logistics with the core team.

CERTIFICATIONS

- **HackerRank Python Developer Certification**: [Certificate](#) (February '25)
- **HackerRank SQL Developer Certification**: [Certificate](#) (January '25)