PRATIK NAIR

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PROFESSIONAL SUMMARY

Python developer & AI engineer with experience at HARMAN International and Iraje Sofwtares in LLM prompt engineering, automotive cybersecurity validation, and test automation. Specializes in building AI-driven QA frameworks for embedded automotive systems; experienced across CI/CD, AOSP, and ISO/SAE 21434-aligned cybersecurity domain

WORK EXPERIENCE

Associate Software Engineer March 2025 - Present
Harman International, Bengaluru

- Co-developed an **MCP-based Android HMI automation agent** (Python) as part of a team, contributing to the design and implementation of **30+ MCP tools** covering screen parsing **(parallel OCR + icon detection)**, Set-of-Mark visual grounding, **HSV-based** UI state inspection, **BFS state-graph** navigation, and semantic test recording with auto-generated Python replay scripts in **Robot Framework**.
- Engineered a **udev/USB fingerprinting** tool in Python for a renowned Japanese OEM resolving **8 serial endpoints** across **2 FTDI FT4232H quad-UART** chips to stable function labels **(VID:PID + EEPROM iProduct + interface index)**, removing reliance on non-deterministic `ttyUSBx` kernel numbering; shipped as a **zero-dependency PyInstaller** binary
- Engineered a **GitHub Actions / Jenkins workflow** on a self-hosted Linux runner that **automates** the **full lifecycle** of a **virtual Android target** through a **6-step HARMAN Loop REST API sequence (create, launch, poll, ADB-key authorize, confirm, endpoint fetch) with OAuth2/Keycloak + TOTP auth.** It executes **10+ CTS APK modules over ADB** in **15-20 minutes** per full run. **Per-module timeouts (30 min), 3-attempt ADB connect retries, and guaranteed always() target teardown** keep runs reliable with **0 orphaned targets**. A **concurrency group plus a kernel-released POSIX flock host lock** queues overlapping **Jenkins and GitHub** runs with **0 ADB collisions** on a shared server. Running with **0 containers cut hosting cost** ; reduced **CTS hardware-testing** time by **∼30%**
- Authored **structured context** configurations to build specialized Copilot **AI agents** for automotive interface test case generation, cutting manual authoring time from **30 min to 3-4 min ; a ∼90% reduction per test case**.
- Pioneered interface test automation authoring **5000+** test cases by building and deploying over a CI/CD pipeline while interpreting **40+ Architecture Planning Items** — first-ever interface testing initiative on the project.
- Validated cybersecurity features across **Gateway ECU, TCU, and HSM** — covering encrypted diagnostic logging, VLAN-based network isolation, secure OTA pipelines, and negative-path build image tampering; verified **50+ builds** aligned with **ISO/SAE 21434** and **UNECE WP.29/R155**.

Cybersecurity Developer August 2024 - March 2025
Iraje Software, Mumbai

- Built and client-deployed a Linux-based **real-time login intrusion detection system** in Python (**∼680 LOC**); monitored auth logs **24/7** via a systemd service, alerting admins over **TCP** to a centralized **Oracle 11G** database with zero downtime post-deployment.

PROJECTS

LockBox *FastAPI, Python, JWT*
Async authentication microservice (FastAPI, Python) with 6 REST endpoints covering full auth lifecycle; implemented JWT access/refresh token pair with DB-backed revocation on logout, bcrypt password hashing, and rate limiting (5 req/min/IP) to mitigate brute-force attacks

Imarec *Python, TensorFlow, Keras, Flask*
CNN image classifier on **CIFAR-10** (60K images, 10 classes); achieved **∼82% test accuracy** with **∼80ms inference time** per image via a Flask web interface.

PixelDetect *Python, Flask, OpenCV, MobileNet SSD*
Real-time object detection web app achieving ∼**20 FPS** on live video; detects **80 COCO object classes** at **0.5 confidence threshold** with bounding-box overlay.

EDUCATION

Master's in Computer Applications Hiray Institute Of Computer Applications, Mumbai 2025
8.5 CGPA (MAH-MCA-CET : 93.8%)

Bachelor's in Information Technology, Thakur College Of Science and Commerce, Mumbai 2023
9.1 CGPA

HSC, Bhavan's College, Mumbai 2020
62.15% (Science)

SSC, St John The Evangelist High School, Mumbai 2018
86.8%

CERTIFICATIONS

Understanding LLMs and Basic Prompting Techniques – CodeSignal (2025)
AI Governance Certification – Securiti AI (2025)
Introduction to Jenkins – Linux Foundation (2025)
Cloud Computing – NPTEL (2024) | **Top 5% among 24,000+ candidates** | Score: 83%

SKILLS

Languages & Frameworks: Python, Java, C++, Flask, TensorFlow, Keras, OpenCV
AI / ML / LLMs: Prompt Engineering, LLM Integration, CNN, MobileNet SSD, OCR, Computer Vision
Test & Automation: JUnit 5, GTest, PyAutoGUI, ADB, AOSP, CTS/VTS
DevOps & Cloud: Jenkins, AWS, Gradle, Git, GitHub, lcov, CI/CD Pipelines
Automotive & Security: CAN, UDS, ISO/SAE 21434, UNECE WP.29, Secure Boot, IDS, OTA Validation
Databases: Oracle 11G, MySQL, Firebase
OS & Tools: Linux, Bash, Jira, ALM, Confluence