

Software engineer **holding a Master's degree in Computer Engineering (Software)** from Imam Reza International University, with hands-on experience in **database design and integration, backend development and business-process automation**. At the **Khorasan Razavi Chamber of Commerce, Industries, Mines and Agriculture**, reverse-engineered and documented the organisation's information systems, designed a Python ETL into a unified master database, and built the operational-budgeting system and SMS management server end to end, from schema to Windows Server deployment. For the thesis, implemented a **hybrid CNN + Vision Transformer framework in PyTorch** and evaluated it with a controlled multi-seed design, statistical significance testing and quantitative explainability checks. Maintains 15+ open-source projects in Python, TypeScript and Go, including CLI tools for developers and AI coding agents.

98.36% test accuracy, ResNet50–ViT	7 × 3 models × seeds, controlled design	25 systems catalogued at the Chamber	15+ open-source projects on GitHub
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EXPERIENCE

Khorasan Razavi Chamber of Commerce, Industries, Mines and Agriculture · Mashhad
Software development, databases and systems integration

■ Data governance & systems integration

SQL Server · T-SQL · MySQL · Python ETL · DBML · OpenAPI 3.0 · Postman · SSO

- Reverse-engineered and documented 9 MySQL systems and a legacy SQL Server database (100+ tables plus views, stored procedures and functions).
- Produced identity cards for 25 systems, a data catalogue and a data-sensitivity matrix as the basis for data governance.
- Designed a Python ETL into a unified master database (golden record) feeding a 360° member dashboard.
- Modelled the ERD in DBML, specified API contracts in OpenAPI 3.0 with a Postman collection, and wrote the target architecture for a unified single-sign-on (SSO) portal.

■ Operational budgeting system

Laravel · Vue 3 · TypeScript · Inertia · MySQL/MariaDB · Windows Server · IIS

- Designed and built a web budgeting system with role-based access control (system admin, manager, staff, viewer).
- Designed the schema in DBML and implemented it on MySQL/MariaDB.
- Deployed on Windows Server + IIS with an automated install script for repeatable setup.

■ SMS management server

Python · Flask · Waitress · SQL Server (pyodbc) · SQLite · openpyxl · Windows service

EDUCATION

M.Sc. in Computer Engineering (Software)
Imam Reza International University, Faculty of Engineering, Department of Computer Engineering
Defense: October 2026 (Mehr 1405)
Thesis: A hybrid framework based on convolutional neural networks and Vision Transformers for intelligent, explainable plant-disease detection
Supervisor: Dr. Kaveh Akbarzadeh Sharbaf

CORE STRENGTHS

- Database design, reverse-engineering and integration
- Backend development and contract-first APIs
- Process automation and Windows Server deployment
- Computer-vision deep learning in PyTorch
- Experimental design and significance testing
- Explainable AI (XAI)
- Tooling for developers and AI agents

- Built the organisation's SMS service on SQL Server with Excel import/export and full Jalali-calendar support.
- Finance and follow-up reporting, audit logging, admin panel and backups.
- Runs as a Windows service on Waitress; core logic covered by automated tests.

Web system for the Arbitration Centre of Iran Chamber ·

Mashhad office

Vue 3 · Vite · Pinia · Django REST Framework · Token auth

- Case filing and tracking, arbitration-fee calculator and staff workflow with a right-to-left UI; MVP delivered to the client.

RESEARCH · M.SC. THESIS

A hybrid CNN–Vision Transformer framework for explainable plant-disease detection

PyTorch · torchvision · ResNet18/50 · ViT-B/16 · Feature fusion · Grad-CAM · Attention Rollout · SciPy

- **Data:** PlantVillage, 54,305 images in 38 classes; removed 21 exact-duplicate groups and 35 near-duplicate pairs before splitting to prevent leakage (train 38,004 / val 8,126 / test 8,121).
- **Controlled design:** 7 models × 3 random seeds × 10 epochs with shared preprocessing and training rules, compared in two groups: trained from scratch and frozen pretrained extractors.
- **Architecture:** two-branch feature fusion; the 2048-d ResNet50 and 768-d ViT-B/16 vectors are each projected to 256 features and concatenated.
- **Result:** ResNet50–ViT reached the highest mean test accuracy (**98.36%**) and macro-F1 **97.62%** vs 96.84% for standalone ViT; the gap was significant in all three seeds (exact **McNemar** test, **Holm** correction over 33 comparisons).
- **Robustness:** on 380 balanced images, ResNet18–ViT led under heavy noise (81.40% vs 68.86%) and ResNet50–ViT under heavy blur (66.05%).
- **Ablation:** removing the ViT features dropped ResNet50–ViT from 97.46% to 87.46%; removing the CNN features, to 92.37%.
- **Explainability:** Grad-CAM and Attention Rollout with quantitative deletion/insertion evaluation and a head-randomisation sanity check; limitations reported transparently.

SELECTED OPEN SOURCE

whystuck

Python

Runs any command under an idle watchdog; when it hangs (pager, editor, y/N prompt, password, watch mode, lock) it says why and prints the non-interactive fix. Zero deps, JSON output for agents.

shellparity

Python

Differs your interactive shell against an AI agent's non-interactive shell (PATH, tool versions, proxies, UTF-8, SSH, git signing) and prints the exact rc-file fix.

whystale

Python

Finds what is older than its source: servers started before .env changed, builds older than code, deps older than the lockfile, generated code older than its schema.

LANGUAGES

Persian: native

English: technical reading & writing

LINKS

Portfolio mrzroot.github.io

GitHub github.com/mrzroot

LinkedIn linkedin.com/in/mrzroot

Telegram t.me/mrzroot

whycached

Python

Finds which cache layer (CDN, browser, service worker, asset name) serves the stale copy of a live URL, with the fix for that layer.

persianprobe

Python

Runs the same 14 Persian-text probes through the runtimes on your machine and shows where they disagree, with the fix for each.

whyenv

Python

Lists every place that can set an env variable in the order your framework reads them (Vite, Next.js, CRA, dotenv, Compose), marks the winner and the ignored edit.

MihanStack

TypeScript

Local emulator for Iranian payment and SMS APIs (Zarinpal, Zibal, Kavenegar, SMS.ir) with failure scenarios, webhooks and record/replay; 62 tests.

dibs

Python

Guards hand-made edits against AI coding agents via git hooks and MCP; zero dependencies, 49 tests.

hamyad · agentforge

TypeScript

Shared project memory for AI tools (MCP server on stdio and Cloudflare Workers); rule sync across Cursor, Claude Code, Windsurf and Copilot.

marz · sabr

Go

Service-reachability scanner for sanctioned regions (WebAssembly, SARIF) and resumable git/docker downloads.

dokhaneh · flowpilot

Python

Release mirroring to GitHub and Iranian hosts with Ed25519-signed manifests; self-hosted workflow automation with Telegram.

paknevis · netdoctor-ir

Python

Persian text linter and auto-fixer (ZWNJ, characters, digits); connectivity doctor and mirror switcher for developers.

SKILLS MATRIX

Area	Technologies	Applied in
Programming	Python · SQL / T-SQL · TypeScript · JavaScript · Go · PHP · PowerShell	Chamber systems, thesis, open source
Databases & data	SQL Server · MySQL / MariaDB · PostgreSQL · SQLite · Redis · DBML · ETL	10 databases analysed, data catalogue, golden record
Backend & APIs	Django / DRF · Flask · FastAPI · Laravel · Node.js · REST · OpenAPI 3.0 · MCP	Budgeting system, SMS server, arbitration centre
Frontend	Vue 3 · Pinia · Inertia · React · Tailwind CSS · RTL UI	Right-to-left enterprise interfaces
Deep learning	PyTorch · torchvision · CNN (ResNet18/50) · ViT-B/16 · Transfer learning · Feature fusion	21 training runs in the thesis
Explainable AI	Grad-CAM · Attention Rollout · Deletion / Insertion · Sanity checks	Quantitative evaluation of saliency maps
Statistics & evaluation	Exact McNemar · Holm · Macro-F1 · Precision / Recall · Multi-seed · Ablation · NumPy · SciPy · Matplotlib	Significance testing of 7 models over 3 seeds
Infrastructure & tools	Git · GitHub Actions · Docker · Jenkins · Windows Server / IIS · Linux	Enterprise deployment, open-source releases
Networking	CCNA / Network+ level · Cisco Packet Tracer · MikroTik	Network labs and configuration