

HASNAT KHAN

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PROFESSIONAL SUMMARY

Results-driven Computer Science student with hands-on experience engineering intelligent automation systems, end-to-end ML pipelines, and full-stack applications. Proficient in Python, PyTorch, Scikit-learn, and Hugging Face Transformers with strong foundations in supervised/unsupervised learning, deep learning, and MLOps workflows. Proven ability to build production-grade REST APIs, automate complex business processes, and implement cryptography-secured systems. Actively upskilling in LLM integration, LangChain, and agentic AI frameworks. Passionate about leveraging AI to eliminate repetitive tasks, accelerate decision-making, and build scalable automated solutions.

TECHNICAL SKILLS

Languages: Python, JavaScript, C, C++, x86 Assembly (MASM), Java, Bash, HTML/CSS

AI / ML Frameworks: PyTorch, TensorFlow, Scikit-learn, Hugging Face Transformers, NumPy, Pandas, Matplotlib

ML Techniques: Supervised & Unsupervised Learning, Deep Learning, CNN, ANN, KNN, Naive Bayes, Decision Trees, K-Means, Hyperparameter Tuning, Cross-Validation, Feature Engineering, Backpropagation

LLM & Automation: LLM Integration, Prompt Engineering, LangChain (in progress), Agentic AI, Workflow & Pipeline Automation, Web Scraping, API Automation

Backend / APIs: FastAPI, Flask, Node.js, Express.js, RESTful API Design, Postman, Middleware Design

Full-Stack: React.js, MERN Stack (MongoDB, Express, React, Node), jQuery, HTML/CSS

Databases: MongoDB, MySQL, NoSQL, Data Pipeline Design, ACID Transactions

Security: Cryptography (RSA, AES-256, SHA-256, Diffie-Hellman), Blockchain (Proof-of-Work), Digital Signatures

Tools & DevOps: Git, GitHub, Jupyter Notebook, Linux CLI (Kubuntu/KDE Plasma), VS Code, CI/CD, Automated Testing

PROJECTS

ML Training Automation Pipeline

2025 – Present

Python · Scikit-learn · PyTorch · GridSearchCV · Jupyter

- Automated complete ML experiment workflows (data ingestion → preprocessing → feature engineering → training → evaluation); reduced new experiment setup time by 60% through reusable Python modules.
- Automated hyperparameter tuning via GridSearchCV pipelines achieving 90%+ benchmark accuracy through cross-validation and model selection, eliminating all manual trial-and-error.

CDC Diabetes Risk ML Classification

2026

Python · NumPy · Decision Tree · Naive Bayes · KNN · ANN — implemented from scratch

- Built custom Decision Tree, Naive Bayes, KNN, and ANN classifiers from scratch using only NumPy (no high-level ML wrappers), achieving 90%+ accuracy on the CDC Diabetes Health Indicators dataset.
- Demonstrated deep understanding of ML internals: backpropagation, entropy-based splitting, and distance-based classification without any framework abstraction.

House Price Predictor — End-to-End ML Pipeline

2026

Python · Web Scraping · Scikit-learn · CustomTkinter GUI

- Engineered an automated ML pipeline that scrapes live property listings from Zameen.com, preprocesses data, trains regression models, and surfaces predictions through a polished CustomTkinter desktop GUI — full deployment from raw data to user interface.

AegisChain — Blockchain Banking System

2026

Python · Cryptography · RSA · AES-256 · SHA-256 · Diffie-Hellman · Digital Signatures

- Implemented hybrid encryption (RSA, AES-256, Diffie-Hellman, digital signatures) for all transaction processing; automated inter-node SHA-256 validation and block creation, achieving 100% tamper detection accuracy in testing.
- Built a real-time monitoring dashboard for anomaly detection, eliminating manual security checks at every transaction step through fully automated blockchain consensus.

MediLink — Healthcare Management System

2025

MERN Stack · MongoDB · Express.js · React.js · Node.js · ACID Transactions · Role-Based Access

- Automated end-to-end patient workflow (scheduling → billing → pharmacy alerts) with ACID-compliant transaction processing and intelligent role-based automation (Admin, Doctor, Pharmacist) with zero manual routing.

- Designed RESTful API middleware layer that auto-validates, auto-logs, and auto-routes all requests, maintaining data consistency across simultaneous billing and inventory updates.

AI-Powered Route Optimization Engine

2025

Python · Flask · React.js · A · Genetic Algorithm · BFS · Algorithm Automation*

- Integrated three AI algorithms (A*, Genetic Algorithm, BFS) into a single decision engine that auto-benchmarks all approaches per request and autonomously selects the optimal delivery route, cutting average path length by 30%.
- Built a Flask REST API delivering routing decisions in under 200ms and feeding results to a live React.js map dashboard; eliminated manual route planning entirely through full end-to-end automation.

Virtual File System

2025

C · POSIX-style System Calls · Memory Management · Custom Shell Interface

- Implemented a virtual file system in C with manual POSIX-style system calls, malloc/free simulation, and a custom shell interface — demonstrating OS-level and low-level systems programming expertise.

RLE Compression Engine — x86 Assembly

2025

32-bit x86 MASM · Lossless Verification · Session Analytics

- Designed and built a lossless Run-Length Encoding compression engine entirely in 32-bit x86 MASM assembly featuring bit-level lossless verification and session analytics.

DSA-Driven Logistics Automation

2023

C++ · Graph Algorithms · AVL Trees · BST · Dijkstra's · Priority Queues · OOP

- Automated hotel reservations and delivery dispatch using AVL Trees, BST, and Priority Queues across 50+ nodes; applied Dijkstra's algorithm to reduce simulated delivery time by 25% with fully event-driven queue processing.

EDUCATION

Bachelor of Science in Computer Science

2024 – Present

COMSATS University Islamabad — Islamabad, Pakistan

- Relevant Coursework: Machine Learning, Artificial Intelligence, Data Structures & Algorithms, Database Systems, Information Security, Software Engineering, Web Technologies, Computer Organization & Assembly Language (x86 MASM).

CERTIFICATIONS

IBM Machine Learning Specialization

2024

Coursera / IBM

- Covered supervised & unsupervised learning, deep learning architectures, neural networks, automated model training, and end-to-end ML deployment workflows across 6 courses.

Mathematics for Machine Learning & Data Science

2024

Coursera / DeepLearning.AI

- Linear Algebra, Calculus, Probability & Statistics — mathematical foundations underpinning AI optimization, gradient descent, and probabilistic modeling.

Crash Course on Python

2023

Coursera / Google

- Python programming, scripting automation, object-oriented programming, and data structures — core tools for AI and ML development.

ACHIEVEMENTS & OPEN SOURCE

- Earned GitHub Pull Shark, Quickdraw, and YOLO achievements through consistent CI/CD-style contribution workflows across 17 public repositories spanning AI/ML pipelines, full-stack applications, and systems projects.
- Active Kaggle practitioner — applying, benchmarking, and iterating on ML models across multiple real-world datasets to sharpen model evaluation skills.
- Dual-boot Linux power user (Kubuntu / KDE Plasma + Windows 11) — comfortable in native Linux development environments for scripting, shell automation, and ML workloads.
- Actively studying LLM integration, LangChain, and agentic AI automation frameworks to stay at the frontier of applied AI engineering.