Muhammad Bilal Tahir

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Education

FAST National University of Computer and Emerging Sciences (NUCES) — Islamabad, Pakistan
BS Software Engineering; CGPA: 3.67/4.00 (4x Dean's List) — *2024 – 2028 (expected)*
Relevant Coursework: Database Systems, Object Oriented Programming, Software Design and Architecture, Operating Systems

Experience

Computer Vision Research Intern — June 2026 – Aug 2026
NCRA UAV Dependability Lab — *Islamabad, Pakistan (Hybrid)*
- Built standardized RGB (14,235 img) and thermal/IR (15,552 img) aerial-object datasets, manually annotating 1,000+ images; ran a pilot study across five detectors (YOLOv8/10/11/12, RF-DETR) to select the best architecture per modality
- Trained YOLOv12x (RGB) and YOLOv10x (IR): 94.11% mAP50 / 92.26% F1 on RGB, 66.57% mAP50 / 76.27% F1 on IR
- Evaluated four VLMs (InternVL2-8B, BLIP-2, Qwen2.5-VL-7B, DeepSeek-VL-7B-Chat) zero-shot and designed a confidence-gated detector–VLM fallback architecture (Adaptive Fallback), implemented in SkyEye; authored the SRS and technical report

AI Engineer Intern — August 2026
Prompt To Flow (National Incubation Center) — *Islamabad, Pakistan (On-site)*
- Built a FastAPI AI workflow engine converting natural-language requests into executable graphs, with provider-agnostic Groq/Gemini fallback, tenant credit gating, and API key rotation.

Full Stack Developer — April 2026 – Present
Markhor Systems — *Islamabad, Pakistan (Remote)*
- Built a medical LMS with Zoom automation, attendance tracking, recording uploads, and real-time community chat
- Delivered several other full stack web and app projects across client engagements, owning each end-to-end from idea to delivery

Software Engineer Intern — Nov 2025 – Jan 2026
RainMakerz — *San Francisco, USA (Remote)*
- Contributed to a serverless Python/FastAPI backend on Azure Functions within a 19-agent AI document processing system
- Engineered agent-level logic with hands-on exposure to DSPy and LangChain/LangGraph pipelines

Projects

SkyEye | *Streamlit, FastAPI, PostgreSQL, Docker, YOLO, VLMs* | GitHub
- Deployable aerial-object detection tool integrating trained YOLO detectors and four zero-shot VLMs behind a single interface, with a confidence-gated Adaptive Fallback mode, persistent run history, and batch processing

Rahnuma | *Next.js, FastAPI, LangGraph, PostgreSQL, pgvector, Clerk* | GitHub
- LangGraph agentic admissions advisor with cited RAG, deterministic merit calculators, and persistent student profiles

Rahbar | *Kubernetes, Docker, GitHub Actions, CI/CD, FastAPI, RAG, ChromaDB, Redis, Ollama, Nginx* | GitHub
- Source-cited RAG assistant answering only from FAST-NUCES documents, deployed on Kubernetes (indexer Job, HPA-scaled API, Redis semantic cache) with a CI/CD pipeline that fails builds when retrieval quality drops

CivicPulse | *React, Vite, FastAPI, PostgreSQL, Redis, Docker, Kubernetes, GitHub Actions, CI/CD* | GitHub
- Full-stack complaint triage platform with AI classification and a rules fallback; multi-stage Docker images, Compose and Kubernetes (Kustomize, HPA) deployment, automated through GitHub Actions CI/CD workflows

CodeGrapher | *CrewAI, Neo4j, Qdrant, FastAPI, Celery, Redis, Docker, Tree-Sitter, Next.js* | GitHub
- Multi-agent pipeline turning any repo into a queryable knowledge graph, tracing blast radius for proposed edits and flagging anti-patterns, grounded in deterministic AST/Tree-Sitter parsing

Technical Skills

CV & Deep Learning : Deep Neural Networks, PyTorch, Hugging Face Transformers, YOLO (Ultralytics), RF-DETR, VLMs, Model Benchmarking & Evaluation
AI & Agentic Systems : LangChain, LangGraph, LangSmith, CrewAI, RAG, Vectorless RAG, Guardrails, Deep Agents, FastMCP, Ragas
Full-Stack Dev : JavaScript, TypeScript, HTML5/CSS3, React, React Native, Next.js, Node.js, Express.js, FastAPI, Streamlit, Tailwind CSS
Backend & Systems Design : PostgreSQL, MongoDB, SQL Server, Supabase, Redis, Cloudinary, REST APIs, JWT, OTP Auth, Clerk, Bcrypt, Socket.IO, Celery, BullMQ
Infra & Tools : Git/GitHub, Docker, Kubernetes, Vercel, Railway, Netlify, Coolify, Postman, Linux, Cursor, Claude Code, Codex CLI, Antigravity, Gemini CLI, GitHub Copilot

Activities, Leadership & Certificates

- Lab Demonstrator (4x), FAST-NUCES — OOP Lab (2x, 100+ students) and Data Structures Lab (2x, 75–80 students)
- Runner-Up — Prompt & Play Competition, Soventure 2025
- Vice Head, AI Battle Arena — NASCON 2026
- Certificates: Neural Networks & Deep Learning; RAG (DeepLearning.AI); Build AI Agents using MCP (IBM); CS50 AI (Harvard)