

# HAMDAN TARIQ

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## EDUCATION

### National University of Sciences & Technology (NUST)

*Bachelor of Science in Artificial Intelligence*

Quetta, Pakistan

2024 - May, 2028

- Majors: Machine Learning, Programming for AI, Data Structures & Algorithms, Database Systems, Cloud Computing, Digital Logic Design, Artificial Intelligence
- GPA: 3.78/4.00 ([Transcript](#))
- Credits earned: 69

### Tameer-i-Nau Public College

*HSSC Pre-Engineering*

Quetta, Pakistan

2022 - 2024

- Percentage: 88.5%

## RESEARCH EXPERIENCE

### Robotics Intern

*Educational Robotics Lab*

June 2026 - Aug 2026

*NUST, Islamabad, Pakistan*

Supervisor: Dr. Farkhanda Afzal

Hours per week: 50

- Engineered ROS2 UAV autonomy stack with ORB-SLAM3, Depth Anything V2 and OctoMap
- Developed autonomous 3D exploration using frontier detection & Next-Best-View planning
- Integrated localization, mapping, exploration, tracking, mission control for autonomous UAVs

### Data Science Intern

*ZEMT Innovations*

June 2026 - July 2026

*NUST, Islamabad, Pakistan*

Supervisor: Dr. Farkhanda Afzal & Dr. Hayat Ali Shah

Hours per week: 45

- Built accident video datasets with curation, cleaning, frame extraction, and PHash deduplication
- Evaluated YOLO, ResNet, VideoMAE, and SlowFast for accident detection

### Robotics Intern

*Al-Khwarizmi Robotics Lab*

Jan 2026 - March 2026

*Jinnah Town, Quetta, Pakistan*

Supervisor: Engr. Hameed Khan

Hours per week: 40

- Built an autonomous line-follower with IR-based path detection and closed-loop motor control
- Integrated & tuned the sensing, & microcontroller system for accurate, stable trajectory tracking

## RESEARCH PROJECTS

### Autonomous Drone | *Robotics, AI*

*National University of Sciences & Technology ([GitHub](#)) ([Website](#))*

June 2026 - Aug 2026

*Internship Project*

- Built ROS2 UAV autonomy pipeline integrating ORB-SLAM3, Depth Anything V2, OctoMap
- Resolved monocular SLAM scale ambiguity using learned depth for metric-scale localization
- Implemented frontier exploration and Next-Best-View planning for autonomous mapping

### Multimodal MRI Synthesis & Brain Tumor Segmentation | *AI*

*National University of Sciences & Technology ([GitHub](#)) ([Website](#))*

Feb 2026 - May 2026

*ML Project*

- Built ResNet-U-Net for multi-class brain tumor segmentation on BraTS 2020
- Developed conditional DDPM for multimodal T1, T2, T1ce, and FLAIR MRI synthesis

- Achieved Dice scores of 0.80, 0.76, and 0.86 across tumor regions

### Project Kisan | *NLP, Large Language Models*

Aug 2026

National University of Sciences & Technology ([GitHub](#)) ([Website](#))

Internship Project

- Built adaptive agricultural AI using Llama 3.2 3B & 3.1 8B with intelligent model routing
- Fine-tuned Llama 3.2 3B via QLoRA on 22.6K QA pairs with FAISS & BGE two-stage RAG
- Deployed FastAPI/Gradio pipeline with RAG, web search, and source attribution

### Gesture-Controlled Drone | *Computer Vision*

June 2026 - Aug 2026

National University of Sciences & Technology ([GitHub](#)) ([Website](#))

Internship Project

- Built real-time DJI Tello control using MediaPipe hand landmarks and gesture recognition
- Engineered 82-D features from normalized landmarks and joint-angle representations
- Trained neural network on 5,259 samples with temporal voting for robust commands

### Animal Detection System | *Computer Vision, Deep Learning*

Feb 2026 - May 2026

National University of Sciences & Technology ([GitHub](#)) ([Website](#))

PFA Project

- Built video based 52-class animal detection pipeline using RT-DETR-X and YOLO11m
- Leveraged RT-DETR for high-resolution and YOLO for fast-moving object detection
- Integrated BotSort and Kalman filtering for persistent multi-object tracking

### Gesture-Controlled Robotic Hand | *Embedded System*

Feb 2025 - June 2025

National University of Sciences & Technology ([GitHub](#)) ([Website](#))

DLD Project

- Built 4-DOF robotic hand controlled through MPU6050-based gesture sensing
- Mapped IMU orientation to servo positions with low-pass filtering for stable motion
- Implemented button-triggered gripper control for real-time manipulation

## VOLUNTEER EXPERIENCE

### Summer Intern

June 2025 - July 2025

[Al-Khidmat Foundation Hospital](#)

Quetta, Balochistan, Pakistan

Supervisor: Mr. Muhammad Sannan Akbar

Total Hours: 48

- Completed volunteer internship covering leadership, entrepreneurship, community development
- Contributed to environmental fundraising initiative securing donations for tree plantation
- Gained hands-on experience in teamwork, project coordination, and professional report writing

## WORKSHOPS & OUTREACH

### Workshop Instructor, Robotics & AI

Army Public School & College, Rawalpindi, Pakistan

5-Day Training Workshop ([Summary](#))

July 2026

Delivered hands-on training in humanoid robotics, sensor integration, autonomous navigation, & drones

### Robotics & STEM Outreach Instructor

Gulhouse International School, Talagang, Pakistan

Hands-on Workshop & Demonstration ([Summary](#))

Aug 2026

Demonstrated humanoid robotics, sensor-based interaction, drones, & engineering problem-solving

### Technical Workshop Presenter

Namal University, Mianwali, Pakistan

2-Day Workshop & Demonstration Session ([Summary](#))

Aug 2026

Presented computer vision, multispectral sensing, autonomous drones, and AI for precision agriculture

## TECHNICAL SKILLS

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**Programming:** Python, C++, SystemVerilog, Assembly, HTML, CSS

**AI/Robotics:** LLMs, RAG, NLP, SLAM, ROS2

**Tools:** Google Colab, MATLAB, Ubuntu, LaTeX, Firebase, SQL, Streamlit, Gradio, Qt Creator, Arduino IDE, Gradio

**Libraries:** Scikit-Learn, TensorFlow, PyTorch, OpenCV, Pandas, NumPy, Matplotlib, Seaborn, Keras, ASIO (C++), OpenGL

## SOFT SKILLS

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Problem Solving

Project & Time Management

Leadership & Teamwork

## CERTIFICATIONS

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**Huawei Certified ICT Associate — Artificial Intelligence** Aug 2026

*SEECS, NUST, Islamabad*

**Biomedical Instrumentation & Healthcare Control Systems in BCI** Aug 2026

*SMME, NUST, Islamabad*

## REFERENCES

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| Name              | Organization           | Title | Phone           | Email                                                                          |
|-------------------|------------------------|-------|-----------------|--------------------------------------------------------------------------------|
| Mohsin Raza Jafri | NUST, NBC, Quetta      | Dr.   | +92-333-6352864 | <a href="mailto:mjafari@nbc.nust.edu.pk">mjafari@nbc.nust.edu.pk</a>           |
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