

Nasim Mahmud Nayan

✉ smnayan670@gmail.com | 📞 +8801742957256

🔗 Portfolio | 🌐 Nasim Mahmud Nayan | 🎓 Google Scholar

Summary

ML Engineer with 2+ years of experience delivering production AI systems in generative AI, computer vision, multimodal, and healthcare ML applications. Published researcher (9+ papers, 80+ citations), specializing in ethical and explainable AI solutions that achieve real-world impact and prioritize user well-being.

Skills

ML/AI	Supervised/Unsupervised Learning, Deep Learning, NLP, Computer Vision, LLM, RAG, XAI, Fairness ML, Multimodal AI, Advanced LLM Prompting
Frameworks	TensorFlow, PyTorch, Scikit-learn, OpenCV, LangChain, Pandas, NumPy, Matplotlib, Seaborn
Production	FastAPI, Docker, Streamlit, Edge Deployment, Git/GitHub, Model Monitoring, CI/CD
Languages	Python, C, C++

Work Experience

Programming Hero (Remote) Dec 2023 – Present

ML Engineer

- **Zenyora AI Wellness Platform**
 - Architected and deployed production AI wellness platform on [Microsoft Store](#), serving 100+ active users
 - Engineered computer vision system for real-time posture detection, achieving 95% accuracy and reducing user eye strain by 40%
 - Developed context-aware productivity coaching using behavioral analytics and real-time interventions
 - Tech: PyTorch, OpenCV, MediaPipe, OCR, LLM, FastAPI, Docker, PostgreSQL
- **Automated Real Estate Sales Agent**
 - Built voice-based virtual salesperson with RAG architecture, enabling 24/7 property inquiries with GPT-4 and Whisper STT
 - Implemented Pinecone vector database with semantic search, achieving 95% query relevance for property matching
 - Deployed conversational AI pipeline processing 500+ daily inquiries with sub-2-second latency, increasing lead engagement 3x
 - Tech: LangChain, RAG, Pinecone, GPT-4, Whisper, ElevenLabs, FastAPI, Docker
- **Student Performance Predictor**
 - Created ML system predicting assignment scores with 85% accuracy, helping 10k+ students improve grades by 15%
 - Tech: XGBoost, Fine-tuning, FastAPI, PostgreSQL, MongoDB

Primacy Infotech Ltd Jul 2023 – Nov 2023

AI Engineer

- Led AI tour planner development for 6 UNESCO sites, reducing itinerary creation from 2 hours to 5 minutes
- Increased tourist satisfaction scores by 35% through personalized route generation using visitor preference analysis
- Tech: LLM, FastAPI, PostgreSQL, Docker, Streamlit

Enhancing Digital Government Economy Project May 2023 – Nov 2023

AI Trainer

- Trained 50+ government professionals in ML/AI through hands-on projects and comprehensive curriculum
- Created educational materials translating complex ML concepts for non-technical audiences

Project Work

- **M-TRUST: Medical AI Bias Mitigation Framework**
 - Developed comprehensive bias detection toolkit with 4 fairness metrics (demographic parity, equalized odds, calibration, and individual fairness) achieving 30.8% reduction in demographic bias while maintaining 98% model accuracy
 - Published open-source Python package for healthcare AI fairness, enabling automated bias auditing across patient demographics
 - Tech: PyTorch, Scikit-learn, Fairness ML | [PyPI](#) | [GitHub](#)
- **Sales Automation CRM Platform**
 - Built multi-agent system with intelligent lead qualification, email verification, and personalized outreach generation using RAG architecture for context-aware responses and automated lead scoring (1-10 scale) based on engagement patterns
 - Integrated ChromaDB vector database, Google Sheets CRM, and SendGrid email automation for end-to-end workflow, reducing manual sales tasks by 90% and improving conversion rates by 2.5x

Tech: GPT-4, RAG, ChromaDB, SendGrid, Docker, Flask | [GitHub](#)

- Multimodal Chest X-ray Diagnosis System
 - Built CheXNet-based diagnosis system for 14 thoracic diseases integrating image and text modalities, discovering 4.3× bias amplification in multimodal medical data
 - Reduced diagnostic disparities from 7.6% to 4.5% across demographic groups using fairness constraints and Grad-CAM explanationsTech: TorchVision, BioBERT, Grad-CAM, Streamlit | [Live](#) | [GitHub](#)
- Trustworthy ECG Analysis Platform
 - Developed multi-modal ECG platform combining real-time monitoring, file analysis, and paper image classification with explainable AI using LIME/SHAP for clinical interpretability
 - Implemented fairness-aware training (score >0.9) and uncertainty quantification for trustworthy predictions, achieving edge deployment with <30MB model size and <100ms inference latencyTech: PyTorch, XAI, Fairness ML, Transfer Learning | [Live](#) | [GitHub](#)

Education

University of Information Technology and Sciences Jan 2019 – Jun 2023

B.Sc. in Computer Science and Engineering CGPA: 3.62/4.00

Thesis: A Multi-Disease Prediction Framework: Leveraging Machine Learning and Real-Time Applications for Improved Health Outcomes

Relevant Coursework: Machine Learning, Computer Vision, Data Structures, Algorithms, Databases

Awards & Recognition

- 1st Place | Inter-university PowerPoint Presentation Competition | UITS 2020
- 2nd Place | Inter-university Programming Contest (45 teams) | UITS 2022
- Employee of the Month | Primacy Infotech LTD | August 2023
- Fastest Problem Solver | UITS Victory Day Programming Contest | 2021

Selected Publications

- Nayan, N. M., et al. "SMOTE Oversampling and Near Miss Undersampling Based Diabetes Diagnosis from Imbalanced Dataset with XAI." IEEE ISCC 2023, pp. 1-6. (Scopus)
- Hossain, M. M., Nayan, N. M., et al. "A Medical Cyber-Physical System for Predicting Maternal Health Using Machine Learning." Healthcare Analytics 2024. (Scopus, 38 citations)
- Hossain, M. M., et al. "AI-Driven Approach for Predicting Maternal Health Risk Factors." IEEE SEEDA-CECNSM 2024. (Scopus)
- 6+ additional peer-reviewed papers in ML and healthcare. Full list: [Google Scholar](#)