# SANIDHYA SINGH

**AI / ML RESEARCH ENGINEERING | MEDICAL AI | MEDTECH**

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## PROFESSIONAL SUMMARY

MedTech-focused AI/ML research engineer and UCD MSc candidate building measurable systems across clinical evidence retrieval, biomedical modelling and medical data analysis. Experienced with Python, PyTorch, FastAPI and reproducible evaluation; turns research questions into tested prototypes, APIs and evidence-backed decisions.

## TECHNICAL SKILLS

**Languages and engineering:** Python, SQL, JavaScript, TypeScript, Git, Linux, Docker, FastAPI, REST APIs, Next.js, Node.js

**Machine learning:** PyTorch, TensorFlow/Keras, scikit-learn, PyTorch Geometric, CompressAI, Transformers, computer vision, GNNs, RAG

**Evaluation and systems:** ROC-AUC, PR-AUC, F1, MCC, ablation studies, BM25, dense retrieval, reranking, LoRaWAN

## EXPERIENCE

**AI Research Intern | DaRyte Ventures Pvt Ltd** | Sep 2025 - Apr 2026 | India

- Built ReAttire, a multi-role veteran-reskilling platform in Next.js and Node.js, translating stakeholder requirements into role-based workflows, backend/API features and testable product iterations.
- Authored 2 AI-literacy and corporate-readiness guides for non-technical learners and contributed API integration, testing, documentation and AI-assisted automation workflows.

**Research and Development Intern | IIT Delhi (A.I.C.)** | Jan 2025 - Jun 2025 | India

- Developed an end-to-end crop-surveillance prototype combining YOLOv11 segmentation/anomaly detection with LoRaWAN sensing and communication; revised the model/data pipeline after lighting variation exposed a weed misclassification.

## SELECTED PROJECTS

**IrishClinicalRAG** | *Python, FastAPI, BM25, BGE, cross-encoder*

- Built a clinical-guidance RAG pipeline over 8 HSE/NCEC documents and 692 section-aware passages, combining BM25, a 692 x 384 semantic index, reciprocal-rank fusion, reranking and exact chunk citations; recorded 29 passing tests, 75.36% statement coverage and approximately 2.0 s warm CPU retrieval.

**VoxRelay Offline Multilingual Subtitles** | *Python, PyTorch, torchaudio, streaming ASR*

- Built an offline multilingual speech-to-English subtitle system integrating streaming ASR, translation and subtitle rendering; engineered and tested a 16 kHz, 512-point FFT, 80-filter log-Mel core that matched torchaudio within an approximately 1.16 x 10^-5 maximum feature difference.

**APObind Binding-Site Experiments** | *ESM-2, PyTorch Geometric, graph attention*

- Investigated residue-level ligand-binding prediction over 10,599 apo-holo protein pairs using ESM-2 embeddings and Graph Attention Networks; structured evaluation around PR-AUC, ROC-AUC, F1, MCC and class imbalance.

**Enhanced Compression Model** | *PyTorch, CompressAI, DIV2K, Kodak*

- Co-developed a hyperprior neural image codec and ablation pipeline; achieved 0.176 BPP, 30.882 dB PSNR and 0.985 MS-SSIM on the 24-image Kodak benchmark and presented the work at IEEE INSTCon 2026.

## EDUCATION

**MSc Artificial Intelligence for Medicine and Medical Research | University College Dublin** | 2026 - 2027 | Ireland

**Bachelor of Technology Honours in Computer Science and Engineering | Manipal University Jaipur** | 2022 - 2026 | India

*Specialization: Internet of Things and Intelligent Systems*

## LEADERSHIP AND CERTIFICATIONS

- SAP National Hackathon finalist: guided an environmental IoT team to the national finals during the second undergraduate year; certificate held.

**Selected learning:** Google Foundations of Data Science; IBM SQL for Querying Databases; IBM Linux Commands and Shell Scripting; LearnQuest Secure IoT Architecture