ADRITEYO DAS

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EDUCATION

Manipal Institute of Technology, Manipal, Karnataka 2023 – 2027
Bachelor of Technology — Computer and Communication Engineering
CGPA: 9.46 *(Ranked in the top 0.65% of the ICT Department)*

Delhi Public School Ruby Park, Kolkata 2021 – 2023
Class XII (CBSE) — 95.2%
House Prefect, Tech Club Core Member

SKILLS

Languages	Python, C/C++, Java, JavaScript, SQL, Bash, HTML/CSS, LaTeX
AI/ML Frameworks	PyTorch, Hugging Face Transformers, OpenCV, TensorFlow, Scikit-learn, XGBoost
Research Areas	Computer Vision, NLP, Deep Learning, Explainable AI, Transfer Learning, GANs
ML Techniques	BERT, CNN, Attention Mechanisms, Feature Engineering, Adversarial Training, Multi-modal Learning
Development	Flask, React.js, Docker, WebSockets, REST APIs, Git, MySQL, JWT, Redis
Tools	CUDA, PyTorch AMP, Streamlit, Prophet, Wireshark, Volatility, IDA Pro

PUBLICATIONS

- **Das, A.**, Shetty, N. P., et al. (2025). **Explainable multimodal deep learning framework for skin cancer detection using clinical and dermoscopic images**. *Frontiers in Artificial Intelligence*, 8, 1608837. DOI: 10.3389/frai.2025.1608837

ACHIEVEMENTS

- **Top 0.65% Academic Performance** in ICT Department with CGPA 9.46/10.0 and awarded Acheiver's Scholarship
- **Published research** in Frontiers in Artificial Intelligence (Q2 journal) on explainable multimodal deep learning
- **Ranked #1 CTF team nationally** in 2025 as part of Team Cryptonite (cybersecurity competitions)
- **1st Position:** EnigmaXplore 2024 CTF, BITSCTF 2024, CruXipher 2024, KashiCTF 2025

EXPERIENCE

Research Intern *February 2025 – Present*
Computer Vision and Pattern Recognition Unit, Indian Statistical Institute *Kolkata, India · On-site*

- Working with **Dr. Umapada Pal** and **Dr. Shivkumar** (University of Salford) on novel deepfake detection using **frequency-domain CNNs with DCT/FFT feature extraction**.
- Co-authored **ACPR 2025** submission achieving **98.37% accuracy** and **0.997 ROC-AUC** on **CIFAKE** dataset, surpassing state-of-the-art methods while being among the most computationally efficient approaches.
- Designed and evaluated on a **custom synthetic dataset** derived from ICDAR for GAN-based scene text deepfakes, outperforming existing baselines on cross-domain generalization.
- Developed robust detection pipeline leveraging **PyTorch AMP, CUDA kernel-level optimizations**, and **handcrafted frequency-domain feature fusion** for real-time inference.
- Implementing **adversarial robustness techniques, multi-scale feature extraction**, and **entropy-based analysis** for improved resilience across multiple deepfake generation pipelines.
- Upon paper acceptance, extending research beyond GAN-based fakes to **deepfake scene text recognition (STR)** and **generalized detection frameworks** capable of handling **diffusion, GAN, and hybrid generation methods**, including temporal consistency analysis for video-based detection.

Undergraduate Research Assistant *July 2024 – Present*
Manipal Institute of Technology *Manipal, Karnataka, India · On-site*

- Collaborating with **Dr. Nisha P. Shetty** on explainable AI, multimodal learning, and cross-lingual NLP research.
- **Published first-author paper** in **Frontiers in Artificial Intelligence** on explainable multimodal disease classification using an **attention-based image-text fusion architecture** achieving **98% accuracy** with Grad-CAM and Integrated-Gradients interpretability.
- Leading research on **criminal intent detection in social media text** using **DistilBERT/Electra fine-tuning**, **FastText** embeddings, and hybrid feature engineering within a **PCC (Pearson Correlation Coefficient) and ACO (Ant Colony Optimization)**-optimized pipeline, integrating a **custom ensemble classification architecture**. Achieved **ROC-AUC: 0.9618**; **manuscript currently under preparation**.

- Working with a team of undergraduates to develop the **SimTransfer** framework for dynamic cross-lingual transfer learning across Indian languages using **BERT-based architectures** with **similarity-guided adaptation mechanisms, gradient-based transfer coefficients, language-specific attention heads**, and **adaptive learning rate scheduling** for optimized multilingual knowledge transfer.

Research & Development Head *January 2024 – Present*
Cryptonite (Team #1 Nationally on CTFtime) *Manipal, Karnataka, India · On-site*

- Leading **AI Research initiatives** focusing on intersection of artificial intelligence and cybersecurity applications.
- Spearheading research on **audio profanity detection using transformer-based models** and **synthetic online social network graph generation** with privacy-preserving mechanisms.
- Mentoring junior researchers on **adversarial machine learning, neural network security**, and **AI-driven threat detection systems**.
- Created advanced challenges for niteCTF 2024 (**#3 rated Indian CTF globally**) focusing on **AI model extraction attacks**, **adversarial examples** and **Digital Forensics**.

VOLUNTEER WORK

- **Open Horizon Robotics (MapMIT Project):** Developed real-time 3D interactive campus mapping system using OpenLayers.js with REST API integration and WebGL acceleration.
- **Rotaract Club of Manipal:** Active member contributing to community service initiatives and educational outreach programs.

PROJECTS

- **ChiefWarden: Enterprise-Grade Hybrid Malware Detection System** *March 2025*
  Python, PyTorch, XGBoost, PE Analysis, Static Analysis, Feature Engineering
  - CLI-based hybrid detection engine combining **static PE feature extraction with XGBoost + MLP ensemble architecture**; achieved **98.89% accuracy on 10K+ malware samples**.
  - Extracted 68+ engineered features including **Shannon entropy calculation, import table analysis, section header parsing**, and **API call graph embeddings**.
  - Implemented **tiered severity classification using multi-class neural networks** with **YARA rule integration** and threat intelligence scoring.
- **SimuTrade: Intelligent Stock Market Trading Simulator with Predictive Analytics** *July 2025*
  React.js, Flask, MySQL, JWT, Prophet, yFinance, REST APIs, Docker
  - Built full-stack trading simulator with **JWT-based RBAC authentication**, secure session management, and modular microservice architecture.
  - Integrated **Facebook Prophet time-series forecasting models** with **real-time yFinance API data streams** for predictive trend analytics and volatility modeling.
  - Developed **Redis-based caching layer with TTL optimization** reducing external API latency by 75% and implementing **real-time portfolio rebalancing algorithms**.
  - Architected **dynamic scoring system using reinforcement learning principles** for gamified community engagement and risk-adjusted performance metrics.
- **GAN-based Damaged Camera Image Reconstruction with Perceptual Loss** *December 2023*
  PyTorch, GANs, Computer Vision, Adversarial Training, Loss Function Design
  - Trained advanced **U-Net generator with PatchGAN discriminator architecture** using **combined adversarial + perceptual + pixel-wise loss functions** for corrupted automotive scene restoration.
  - Achieved **PSNR: 28.4 dB, SSIM: 0.847** on test datasets using **VGG-based perceptual loss**, **spectral normalization**, and **progressive growing techniques**.
  - Deployed production-ready **Streamlit interface with real-time GPU inference** supporting batch processing and **AMP optimization** for edge deployment.

This resume was last updated on 2025-08-08.