

NIKHIL SINGH

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EDUCATION

Guru Gobind Singh Indraprastha University [\[Link for transcripts\]](#)

July 2025

New Delhi, India

Bachelor of Technology from Bharati Vidyapeeth College of Engineering. (GPA: 8.3 / 10)

Major in Electronics and Communication Engineering with Minor in Computer Science Engineering.

- **Relevant Coursework:** Data Structures and Algorithms (C++), Probability & Statistics in CS (Python), Intro to CS II (C++), Linear Algebra with Computational Applications (Python)

EXPERIENCE

AtheroPoint [\[Link for transcripts\]](#)

July 2025 – Present

California , USA

Research Intern

- Designed and optimized biomedical segmentation networks including ResNet, U-Net, U-Net 2P, U-Net 3P, and Transformer-enhanced hybrids, achieving up to **94% accuracy** in carotid ultrasound plaque analysis and vessel boundary detection across multi-center datasets.
- Introduced a two-stage Transformer–Attention U-Net trained over **13 tuner combinations**, where the top-performing model (B1+T4) surpassed baselines by **15%** and was adopted as the next release of **AtheroEdge™** for automated vascular imaging.
- Built scalable computer vision pipelines using TensorFlow, PyTorch, and Scikit-learn, integrating morphology, skeletonization, and automated feature extraction to process large-scale clinical images and generate reproducible biomarkers.

Ethara AI (Prev. Green Rider Technology) [\[Link for transcripts\]](#)

Dec 2024 – Feb 2025

Gurugram, New Delhi

Software Engineer (Generalist)

- Fine-tuned large language models (LLMs) using **Reinforcement Learning with Human Feedback (RLHF)** and **Supervised Fine-Tuning (SFT)**, achieving nearly **20% improvement in downstream task accuracy**, enhanced contextual coherence, and superior generalization across biomedical and conversational NLP benchmarks.
- Researched, evaluated, and deployed state-of-the-art **LLM architectures and fine-tuning strategies**, optimizing instruction-following, knowledge grounding, and domain adaptation for specialized datasets, leading to measurable performance boosts in large-scale generative and retrieval-based systems.

Research Assistant

July 2024 – July 2025

Bharati Vidyapeeth College of Engineering, Guide: Dr. Arun K. Dubey

New Delhi, India

- Reproduced state-of-the-art biomedical segmentation models (**U-Net, Attention U-Net**) on carotid ultrasound datasets using distributed **GPU clusters**, meticulously tuned hyperparameters, and robust evaluation pipelines, leading to the development of a novel variant that achieved higher segmentation accuracy, enhanced plaque delineation, and consistent cross-patient generalization.
- Implemented and benchmarked **Transformer-based architectures** including **TransUNet, Swin-UNet, and hybrid CNN-Transformer frameworks**, adapting them for biomedical imaging through large-scale pretraining, advanced attention fusion, and performance comparison with CNN baselines, achieving measurable gains in segmentation quality and model stability.

PUBLICATIONS & PATENTS (UNDER REVIEW)

Research Papers (Under Review)

- **Singh, N.***, El-Baz, A., Dubey, A. K., Suri, J.S., et al. “*Plaque Burden and Carotid Intima-Media Thickness Measurements in Ultrasound Scans: Are Transformer Tuners a Must for UNet Architectures?*” Manuscript **Under Review** at **Knowledge-Based Systems (KBS)**, Elsevier (Q1, Impact Factor: 7.6).
- **Singh, N.***, Dubey, A. K., et al. “*Attention/Transformer-based artificial intelligence models for carotid segmentation and intima media thickness/plaque area measurements in Japanese ultrasound scans.*” Manuscript **Under Revision** at **Measurement Journal**, Elsevier (Q1, Impact Factor: 5.6).
- **Singh, N.***, Vohra, R., Dubey, A. K., Jain, P. K., Biswas, M., Tiwari, E., et al. “*A comparative study of the latest artificial intelligence-based models for plaque measurement in a carotid ultrasound-based Japanese cohort.*” Manuscript **Under Review** at **Biomedical Signal Processing and Control (BSPC)**, Elsevier (Q1, Impact Factor: 4.9).

Patent

- Co-Inventor, “*Two-Stage Systems*”, to be filed with the **United States Patent and Trademark Office (USPTO)** (by December 2025).

TECHNICAL SKILLS

Languages: Python, C++, C, SQL, Bash, JavaScript, TypeScript, HTML, CSS, PHP, MATLAB, Lua

Frameworks & Libraries: TensorFlow, PyTorch, Keras, Scikit-learn, NumPy, Pandas, OpenCV, Matplotlib, Seaborn

AI/ML Concepts: Machine Learning, Deep Learning, Neural Networks, Computer Vision, Natural Language Processing, Reinforcement Learning, Data Preprocessing, Model Deployment

Tools & Platforms: Git, Neovim, Vim, GitHub, Docker, Jupyter Notebook, Kaggle, Google Colab, MLflow, Visual Studio Code, Linux, Windows