

Ruthvik Nath Bandari

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Education

Northeastern University, Boston, MA

Masters in AI

Sep. 2025 - Present

Expected: Dec. 2027

Coursework: Applied AI, Applied ML, Deep Learning, NLP, Computer Vision, Python

GPA: 4.0/4.0

Sathyabama University, Chennai, India

Aug. 2021 - May 2025

Bachelor of Engineering in Computer Science (AI Specialization)

Coursework: Machine Learning, Neural Networks, Deep Learning, Generative AI & LLMs

Technical Skills

Languages: Python, SQL, TypeScript, JavaScript, Bash, HTML/CSS

ML & Deep Learning: PyTorch, TensorFlow, Hugging Face, Scikit-learn, XGBoost, OpenCV, LoRA Fine-Tuning, Transfer Learning

LLMs, RAG & Agents: RAG (Dense + BM25), Multi-Agent / Tool-Calling, vLLM, LangChain, OpenAI, Anthropic & Gemini APIs

Data & MLOps: Polars, Pandas, NumPy, Parquet, DuckDB, MLflow, Weights & Biases, DVC, Docker, GitHub Actions CI, SLURM

Analytics & Visualization: Tableau, Power BI, Plotly, SHAP, BERTopic, pandas-ta, K-Means / HDBSCAN Clustering

Databases & Backend: PostgreSQL / pgvector, Redis, SQLite, FAISS, TF-IDF, FastAPI, Flask, REST APIs, React, Next.js

Experience

Research Assistant

Jan. 2026 - Present

Northeastern University, Boston, MA

- Engineered a global healthcare regulatory RAG dataset spanning 199 countries and 200 authorities: 59,284 semantic chunks from 9,321 validated documents via a 5-stage pipeline with 111 scrapers, 4 APIs, and 539+ tests.
- Co-built RA Copilot, a Canvas-embeddable RAG tutor whose 5-stage route/retrieve/generate/ground/frame pipeline runs over a 611-chunk knowledge base and an 11-module, 70-topic curriculum map that drives step-by-step deferral.
- Built hybrid pgvector + BM25 retrieval with cross-encoder reranking and LettuceDetect/MiniCheck groundedness verification, on a ports-and-adapters backend with a config-only GPU-to-CPU serving switch (self-hosted vLLM) and 201 passing tests.

Research Assistant, Center for the Future of Higher Education and Work (CHEW)

Apr. 2026 - Present

Northeastern University, Boston, MA

- Automated the data-ingestion pipeline that onboards institutions into the analysis system, designing a config-driven intake so each new institution is added with no component code changes.
- Packaged the app for shared/HPC deployment with a SLURM-compatible startup script and a password-gated auth server.
- Led a full-stack redesign of the compliance web application (React 19, TypeScript, Vite, Tailwind CSS 4, TanStack Router, Zustand, Zod) with Clerk auth and Playwright + axe-core accessibility testing.

ACM Student Chapter, Chapter Lead

Aug. 2022 - May 2025

Sathyabama University, Chennai, India

- Ran 10+ hands-on workshops on Git, Python, and applied AI/ML, including Computer Vision, Deep Learning, and Advanced Neural Networks, training 100+ students over 3 years.
- Mentored junior members and taught classes on AI systems, from fundamentals to building working models.

Projects

DiaFoot.AI | Python, PyTorch, DINOv2, FastAPI, ONNX, SLURM

- Built a cascaded multi-task diabetic-foot CV system (triage, wound segmentation, Wagner staging) on DINOv2 ViT-B/14 with LoRA fine-tuning, reaching 98.4% triage accuracy, 0.999 macro-AUROC, and segmentation Dice 0.891 on leakage-audited splits.
- Found and eliminated 96,829 near-duplicate train/test image pairs with a perceptual-hash leakage audit, rebuilt splits to zero overlap, then cut inference latency 4.5x (1056 ms to 235 ms) via an ONNX export validated at 99.99% mask parity.

Intraday Direction Intelligence Platform | Python, PyTorch, MLflow, pandas-ta

- As part of a 3-person team, built the data-cleaning and training pipeline for an intraday 3-class stock-direction system on 30 S&P 500 tickers (133,660 rows, 34 features), with EWMA volatility-normalized labels, length-60 sliding windows, and session-safe leakage controls.
- Trained three deep-learning families (LSTM + temporal attention, Temporal Fusion Transformer, Dilated CNN-BiLSTM) with focal loss, AMP, and warmup plus cosine LR, tracked in MLflow, landing macro-F1 roughly 0.15 above the majority-class baseline.

Achievements

- AI Innovation Award, Lahey Clinic Care-AI-thon** - Won as the only student team, beating industry and medical-school teams with BreatheWell, a CT lung cancer screening eligibility and patient outreach system.
- Finalist, Subconscious AI × ACM Hackathon** - Developed a blood report analyser using Tim GPT that flags anomalies, explains root causes, recommends dietary fixes, and routes severe cases to the relevant medical specialist.

Publications

Automating Research Intelligence: AI-Generated vs Manually Designed Pipelines - TechRxiv (IEEE), DOI:

[10.36227/techrxiv.177040642.26830215/v1](https://doi.org/10.36227/techrxiv.177040642.26830215/v1), 2025.