

# Akshay Nayak

Virginia, United States | [akshay03nayak@gmail.com](mailto:akshay03nayak@gmail.com) | +1-571-622-9592 | [www.akshaynayak.info](http://www.akshaynayak.info) | [linkedin.com/in/its-akshay-nayak](https://linkedin.com/in/its-akshay-nayak)

## WORK EXPERIENCE

### ● Software Engineer II, Mastercard

March 2023 - August 2024

- Enabled on-premise experimentation flow equivalent to cloud based transaction test event setup and analysis for 10+ APAC partner banks.
- Designed and implemented experimental analysis versioning enabling iterable experiment configuration, modeling and continuous analysis.
- Automated event-to-analysis pipelines reducing data duplication overheads, saving clients over 65% of routine experimentation setup costs.
- Rebuilt pipeline systems that diagnosed and cut analysis execution time by 98% (1.5 hours to 3 minutes) on large enterprise datasets.

### Software Engineer I, Mastercard

July 2021 - March 2023

- Built an experimentation platform for APAC banks requiring on-premise deployment over the cloud product due to data residency policies.
- Shipped Modeling Output and Attribute Bucketing to visualize ML results and isolate campaign performance across customer cohorts.
- Revamped Jupyter notebook based modeling efforts into Django, React and TypeScript based visualization and analytics platform.
- Implemented and managed Postgres based recovery & snapshot mechanism focused on experimentation consistency, and ability to restore.

## RESEARCH EXPERIENCE

### ● Research Assistant, ART-MED Lab, GWU (Advisor: Prof. Chung Hyuk Park)

August 2025 - May 2026

- Architected a multi-agent clinical AI system where specialized LLM experts independently analyze patient data, debate, and reach a verified consensus diagnosis across MedQA dataset.
- Created a Bayesian belief-state tracker that ranks candidate diagnoses across conversation turns, classifies each clinical finding by diagnostic certainty, blocking any diagnosis until a confirmatory, condition-specific test result is on record and ledger.
- Designed an adaptive trust monitoring system that scores every LLM decision across 10 clinical dimensions, runs a two-stage fast/full audit pipeline, auto-corrects low-trust outputs, preventing hallucination from reaching the final diagnosis.

### ● Machine Learning Research Intern, Computational Intelligence Lab, IISc Bangalore

May 2018 - July 2018

- Pioneered a novel system for identifying disguised individuals by leveraging facial landmarks and motion signatures.
- Developed a comprehensive dataset of 3,072 videos, featuring 16 disguises, 2 motion patterns, and 6 positional variations for each subject.
- Applied MTCNN for precise facial landmark detection and Part Affinity Field for binary stick frame video generation.
- Architected a pose estimation and identification model based on the 3D-ResNet framework, achieving precise classification across 16 unique classes. The dataset features 192 videos per class, encompassing diverse activity patterns from 8 men and 8 women aged 17–21.

## INTERNSHIP EXPERIENCE

### ● AI Developer Intern, George Washington University

May 2025 - August 2025

- Built a multi-tenant RAG platform enabling organizations to query internal documents through a citation-aware conversational interface.
- Retrieved and ranked information using embedding-based semantic search to support scalable document Q&A workflows using NextJS.
- Streamlined async document ingestion pipelines with event-driven jobs and failure-tolerant task queues for reliable large-scale indexing.

### ● Machine Learning Intern, Alan Turing Institute, London

January 2021 - July 2021

- Analyzed 123K+ financial customer reviews from Trustpilot to study customer sentiment across traditional banks and fintech platforms.
- Applied LDA topic modeling, econometric regression, and transformer-based NLP to identify drivers of customer sentiment and behavior.
- Developed a finance-domain sentiment model outperforming generic NLP baselines and improving feedback analysis workflows by 55%.

## SKILLS

- **Programming Languages:** Python, C++, JavaScript, Golang, C, Java, TypeScript, SQL, Bash.
- **AI & Intelligent Systems Engineering:** LLMs, RAG Pipelines, Information Retrieval, Ranking Systems, NLP, Deep Learning, Statistical Modeling, Experimental Design, Recommendation Systems, Feature Engineering.
- **Frameworks & Tools:** React, Next.js, Django, Flask, PyTorch, TensorFlow, Scikit Learn, LangChain, Docker, Kubernetes, AWS, GCP, Azure, PostgreSQL, Vector Search, SLURM.

## EDUCATION

### ● Master's of Science in Computer Science (Thesis Track).

Washington DC, USA

George Washington University (GPA - 3.90/4.00)

August 2024 - May 2026

- **Thesis** - Trust Calibration in Human Autonomous Interaction and Clinical Agentic Systems.

## **PROJECTS**

- **ReplateIO** (React, TypeScript, Vite, Framer Motion, Firebase, Gemini AI, Vercel, Capacitor)
  - Forged AI-driven food recovery platform converting verified peer exchanges into carbon credits via a double-blind handshake protocol.
  - Deployed a B2B carbon marketplace where enterprises bid, trade, and retire community carbon credits with compliance certificates.
  - Assembled a serverless offline-first system with smart dietary matching, optimistic UI, and enterprise carbon heat map dashboard.
- **Supervised Fine Tuning (SFT) of LLM for code generation** (Pytorch, Hugging Face, Deepseek Code LLM, NLP, Python)
  - Fine-tuned DeepSeek Coder 7B on 5,000 APPS problems via SFT pipeline, improving Python code generation and reasoning.
  - Optimized training via gradient checkpointing, memory-aware batching, LR scheduling, and early stopping.

## **PUBLICATIONS**

- **Nayak, Akshay.** Trust Calibration in Human Autonomous System Interaction. The George Washington University ProQuest Dissertations & Theses, 2026. 32668547.
- **Nayak, Akshay,** Taranath, Pruthvi (2024). Behavioral Data Science in Financial Services. In The Cambridge Handbook of Behavioural Data Science (eds Ganna Pogrebna, Thomas T. Hills). Cambridge University Press.  
<https://www.cambridge.org/core/books/cambridge-handbook-of-behavioural-data-science/D95FB48167B9F693F18141FE08CCEEB8>
- **Nayak, Akshay** et al. "INASNET: Automatic identification of coronavirus disease (COVID-19) based on chest X-ray using deep neural network." ISA Transactions 124 (2022): 82 - 89.
- **Nayak, Akshay** et al. "Forged File Detection and Steganographic content Identification (FFDASCI) using Deep Learning Techniques." Conference and Labs of the Evaluation Forum (2019).
- Srinivas, M., Saurav, S., **Nayak, Akshay** and Murukessan, A.P. (2021). Facial Expression Recognition Using Fusion of Deep Learning and Multiple Features. In Machine Learning Algorithms and Applications (eds M. Srinivas, G. Sucharitha, A. Matta and P. Chatterjee).  
<https://doi.org/10.1002/9781119769262.ch13>