Akshay Nayak

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SUMMARY

Software Engineer with **4+ years** of experience, including **3+ years at Mastercard** developing experimentation platform and building scalable backend, full-stack, and AI systems across fintech and applied AI. Skilled in APIs, RAG pipelines, multi-agent LLM architectures, and production-grade software design, with proven impact in performance optimization, automation, and reliable AI product delivery.

WORK EXPERIENCE

Assistive Robotics Tele-MED Lab, George Washington University (Advisor: Prof. Chung Hyuk Park)

Agentic AI Engineer — **08/2025 - 05/2026**

- Architected a modular **multi-agent clinical AI system** with specialist LLM agents, debate orchestration, shared state tracking, and consensus generation, improving **Llama-3.1-8B** diagnosis accuracy from **38.68% to 50.00%** across **106 MedQA-style scenarios**.
- Designed a Bayesian belief-state tracker as the system's reasoning memory, ranking diagnoses across turns, updating evidence state, and blocking unsupported outputs without confirmatory clinical findings.
- Engineered an adaptive **trust monitoring system** that scored every LLM decision across **10 clinical dimensions**, ran a two-stage fast/full audit pipeline, and auto-corrected low-trust outputs to prevent unsupported reasoning, recovering **15 of the 38 hardest diagnostic cases**.

Digital Humanities Institute, George Washington University (Advisor: Prof. Alexa Alice Joubin)

AI Developer Intern — **05/2025 - 08/2025**

- Built a **multi-tenant RAG** platform serving **250+ professors**, enabling citation-aware document Q&A across internal knowledge sources.
- Retrieved and ranked information using embedding-based semantic search to support scalable document Q&A workflows using Next.js.
- Streamlined async document ingestion pipelines with event-driven jobs and failure-tolerant task queues for reliable large-scale indexing.

Mastercard

Software Engineer II — **03/2023 - 08/2024**

- Delivered Analysis Setup and Event Setup workflows for **10+ APAC** partner banks, contributing to a **120% increase** in product revenue.
- 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 experiments setup costs.
- Rebuilt pipeline systems that diagnosed and cut analysis execution time by **97% (1.5 hours to 3 minutes)** on large enterprise datasets.

Software Engineer I — **07/2021 - 03/2023**

- Built an experimentation platform for APAC banks requiring on-premise version 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 Postgres-based recovery and snapshot mechanisms to improve experimentation consistency and restore capability.

Behavioral Data Science Group, Alan Turing Institute (Advisor: Prof. Ganna Pogrebna)

Machine Learning Intern — **01/2021 - 07/2021**

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

Computational Intelligence Lab, Indian Institute of Sciences, Bangalore (Advisor: Prof. S.N. Omkar)

Machine Learning Intern — **05/2018 - 07/2018**

- Modified MTCNN for precise facial landmark detection and Part Affinity Field for binary stick frame video generation and gait analysis.
- Created a 3D-ResNet-based identification pipeline, featuring **16** disguises, 2 motion patterns in 6 positional forms for each of 16 subjects.

TECHNICAL SKILLS

- **Programming Languages:**Python, C++, Java, JavaScript, TypeScript, Go, C, Bash.
- **Frontend:**React.js, Next.js, Vite, Framer Motion, HTML, CSS, AEM.
- **Backend & APIs:**Node.js, Django, Flask, FastAPI, REST APIs, API Design, Microservices, Message Queues.
- **AI/ML & Agentic Systems:**PyTorch, TensorFlow, HuggingFace, LangChain, LangGraph, DSPy, RAG, Vector Search, Agent Evaluation.
- **Models:** GPT, Claude Sonnet, Gemini Pro, Mixtral, DeepSeek, Qwen, MLX Format Models.
- **Databases & Data:**SQL, PostgreSQL, MongoDB, Firebase, pgvector, Redis, Large-Scale Data Processing, Statistical Modeling.
- **Cloud, DevOps & Tools:**Docker, Kubernetes, AWS, GCP, Azure, SLURM, Splunk, Git, Stash, Jira, CI/CD, Linux, Postman, Vercel.

EDUCATION

- **Master of Science in Computer Science (Thesis Track).** — **Washington DC, USA**
  George Washington University (GPA - 3.90/4.00) — **08/2024 - 05/2026**
- **Bachelor of Technology in Computer Science & Engineering.** — **Telangana, India**
  National Institute of Technology, Warangal (GPA - 7.3/10.00) — **07/2017 - 05/2021**