Nivedhitha Dhanasekaran

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Objective

Seeking a challenging Software Engineer role to develop high-performance, data-intensive, large-scale applications by leveraging my expertise in machine learning systems, distributed cloud computing, and observability engineering.

Education

Carnegie Mellon University (Language Technologies Institute, School of Computer Science) Pittsburgh, PA
Master of Computational Data Science in **Analytics (ML Systems)** & Human-computer Interaction *Aug 2023 – May 2025*

GPA: *3.89* **Coursework**: Cloud Computing, AI Engineering, Deep Learning (PhD) - [Paper], On-Device Machine Learning, Computational Methods for Interactive Systems **TA:** Interactive Data Science **Awards:** Winner @AI Agents Weekend Hackathon 2025 by Google & DeepMind

Anna University (Sri Sivasubramaniya Nadar College of Engineering) Chennai, India
B.E. Computer Science & Engineering (First Class with Distinction) *Aug 2018 – Jul 2022*

GPA: *3.95* **Coursework**: Big Data Analytics, Distributed Systems, Databases **Awards:** Sem. Silver Medalist; Smart India Hackathon Winner; Funded Underwater Robotics Team Lead [Winner @IEEE] **Leadership:** C Teaching Assistant; Newsletter Chief Editor **Capstone:** Filed Patent

Skills

Languages/Database Technologies: Python, C++, Java, Scala, SQL, PostgreSQL, MongoDB, Elasticsearch, Unix, Oracle
Big Data Platforms/Machine Learning: Databricks, Spark, Kafka, Hadoop, PyTorch, MLFlow, LangChain, LlamaIndex, XGBoost, Scikit-learn
Cloud/Web/Deployment/Observability: AWS, Google Cloud, Azure, Docker, Kubernetes, Terraform, Helm, Jenkins, CI/CD, Prometheus, Grafana
3D Computing/Robotics/On-Device AI: OpenGL, OpenCV, Arduino IDE, MLX, Gurobi, PyQt5, PyQtGraph, Trimesh, LiteRT

Experience

Responsible, Resilient, Reliable, Language Interactive Technologies Lab, CMU (with Norstella) Pittsburgh, PA
Machine Learning Research Intern *May 2024 – May 2025*

- Built an end-to-end pipeline under Dr. Mona Diab, using structured query prompting for compliance violations, work accepted to ACL Findings 2025 and now being adapted for enterprise-scale policy processing, data warehousing, and ETL analytics with Norstella.

Citi - Cards & Customer Acquisitions Chennai, India
Software Development Engineer *Jul 2022 – Jun 2023*

- Streamlined RESTful APIs & data management for Angular (Typescript) applications, achieving increased operational efficiency and reduced cognitive load through responsive UI/UX design across Singapore and Hong Kong markets.
- Set up automated deployment & observability processes using Jenkins CI/CD, AWS EC2, and PM2 for release cycles, actively contributing to code reviews, pair programming, and unit testing to ensure high-quality, scalable code.
- Developed a cloud-based investment portfolio optimization platform with Python, Flask, and MySQL, integrating multi-asset data ingestion and real-time visualizations, applying CAPM for optimal risk-return analysis, deployed through Jenkins and Docker in a CI/CD pipeline.

Software & Societal Systems Department, Carnegie Mellon University Remote
Data Science Research Intern *Jan – Jul 2022*

- Published the first automated detection system in PyTorch for Giant Cell Arteritis, achieving 91.65% accuracy in whole-slide inference, validating with GradCAM visualizations and pathologist review, and supporting NIH-funded AI research in pathology. [Website][Paper]
- Conducted a CDC-funded, blinded validation study on carbon nanotubes (CNT/F) toxicity using statistical analysis and clustering techniques, producing toxicity profiles from physical measurements and aligning results with in vivo/in vitro benchmarks through data visualization.
- Built a cross-platform mobile app, ApneaStat, using React Native and JavaScript to enable real-time sleep apnea diagnosis via Pulse Oximetry data, integrated Redux and D3.js for dynamic state management and data visualization.

Fidelity Investments - Distributed Electronic Compliance Reporting Platform, Mutual Funds Chennai, India
Full Stack Engineer Intern *Jun 2021 – Jul 2021*

- Built scalable ETL backend and Angular dashboard with field-level custom masking to enable audit-compliant reporting, unblocking the migration of 2 enterprise clients (15K+ accounts) to a cloud-based compliance platform.
- Engineered batch ingestion and search automation in Java with Oracle DB and Jenkins, using SQL indexing and query profiling to cut manual report processing from 2-5 minutes per item to <2 minutes for 500-report batches, enabling full workflow automation.

Underwater Acoustics Research Lab, SSN College of Engineering Chennai, India
Software Development Engineer (Funded Student Project) *Jun 2019 – Jun 2022*

- Led 7 students for hybrid (joystick & autonomous) navigation using C++ mission planning (MIT MOOS-IvP) and GAN-based visibility enhancement, integrated kill-switch & homing logic, achieving >90% mission success and reducing critical failures by >70%. [Website]
- Built a marine threat detection system with YOLOv3 & MobileNetV2 on underwater video, Arduino-based IMU sensor fusion, and tethered diagnostics monitoring to fix >5 data drift issues and enable real-time swimmer alerts. [IEEE Winner Video Demo] [News] [Paper]

Projects

- **Promo Miner, Shopping AI Agent (Apr 2025)**: Built a Gmail-based promo parsing and deal-ranking system using Gemini LLMs, Exa Search, and Firebase, uncovered ~$200/day in missed savings, and won the AI Agents Weekend Hackathon 2025 by Google & DeepMind. [Website]
- **End-to-end Movie Recommender System Deployment & Monitoring (Apr 2025)**: Achieved 2.34 RMSE (online), <0.4s latency, and >90% request success, ingested data from Kafka streams, monitored system health via Prometheus & Grafana alerting, and enabled A/B testing for training data, engagement & fairness drift detection with automatic retraining (MLFlow) and infrastructure tests (GitHub Actions). [Website]
- **Mid-Air Two-hand (10 DOF) Arduino Gesture Controller for Gaming (Mar 2025)**: Built and deployed a TinyML-powered gesture recognition system on Arduino Nano 33 BLE for mid-air 3D interaction; achieved 99% on-device classification accuracy and reduced average task time from ~170s to ~33s across 5 users through model tuning, signal stability filters, and two-handed ergonomic design. [Website]
- **NoteRecall: On-Device Retrieval-Augmented QA System (Dec 2025)**: Developed a privacy-preserving RAG pipeline for medical documents using quantization, distillation, and on-device optimization, achieving 0.56 BERTScore with 2.4x speedup under a 10Wh budget. [Website]