# Nikhil Mandayam Adyapak

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## SUMMARY

Master's student in Data Science at UW-Madison with 2+ years of experience as a Senior Software Engineer building scalable MLOps platforms and distributed AI systems. Specialized in the engineering side of AI, including architecting cloud-native training pipelines on Azure Kubernetes Service (AKS) and optimizing GPU infrastructure. Proven track record of reducing training cycles and engineering efficient data retrieval systems for ADAS.

**Actively seeking Summer 2026 (May–Aug) and Co-op (July–Dec) opportunities in Machine Learning Engineering, MLOps, and Data Science.**

## EDUCATION

**University of Wisconsin-Madison** — Sep 2025 - May 2027
Masters in Data Science — GPA - 3.65/4.00
**Coursework**: Machine Learning, Foundation Models, Database Design & Implementation, Statistical Models, Statistical Methods, Statistical Inference for Data Science

**PES University - Bengaluru, India** — Aug 2019 – May 2023
Bachelor of Technology in Computer Science & Engineering — GPA - 3.78/4.00
**Specialization**: Machine Intelligence & Data Science
**Coursework**: Algorithms, Data Structures, Data Science, Linear Algebra, Machine Learning, Big Data, Cloud Computing

## TECHNICAL SKILLS

**Programming languages**: Python, C, C++, Java, SQL, R
**ML & Statistics**: PyTorch, TensorFlow, HuggingFace, Transformers, LLM, CNN, GAN, scikit-learn, OpenCV, matplotlib
**MLOps & Workflows**: Ray, MLFlow, DVC, Argo Workflows, Azure ML Studio, Prometheus, Grafana
**Cloud**: Azure, AWS, AKS, Docker, Terraform, Azure DevOps, GitHub Actions, Linux
**Databases & Tools**: ElasticSearch, PostgreSQL, MySQL, MongoDB, FastAPI, Flask, Streamlit, GitHub

## RESEARCH EXPERIENCE

**Bosch Global Software Technologies (BGSW)** — Bengaluru, India
**Senior Software Engineer** – AI Systems for Advance Driver Assisted Systems (ADAS) — Aug 2023 – Aug 2025
- Engineered **scene-understanding** image retrieval pipeline for **fine-grained dataset** generation: scene graphs (**hugging face transformers + ensemble of foundation models**) improving corner-cases for complex driving scenarios.
- Applied **image-complexity estimation** for **cost-aware labeling**, cutting annotation effort and labeling costs by **30%**.
- Researched optimal deployment strategies for multi-tenant **Ray Clusters** on **on-premise workstations** and **Azure Kubernetes Service (AKS)** to efficiently support **ML Workloads**.
- Integrated **CLIP embedding** re-use with **80%** cross-version alignment, avoiding full re-indexing of legacy image vectors.

**Center for Information Security Forensics and Cyber Resilience, PES University** — Bengaluru, India
Summer Research Intern; Advisor: Prof. Vineetha B, Dr. Prasad B Honnavalli — May 2021 – Nov 2021
- Research Intern in the **Cryptography Domain**, specifically in **Cryptanalysis of Ciphers.**
- Developed Novel ways of Decrypting Columnar Transposition Ciphers without needing the encryption key or its length.

## INDUSTRY EXPERIENCE

**Bosch Global Software Technologies (BGSW)** — Bengaluru, India
**Senior Software Engineer** – AI Systems for Advance Driver Assisted Systems (ADAS) — Aug 2023 – Aug 2025
- Delivered **MLOps platform** for pedestrian detection (**Azure ML Studio + MLFlow**) with end-to-end **ML lifecycle**; enabled **multi-GPU training** (**3x** faster) and cut GPU costs by **60%**.
- Designed and scaled a **Ray Cluster** based distributed **ML training** system on **Azure Kubernetes Service (AKS)**, reducing retraining cycles from **4 weeks** to **1 week** (**75% faster**) and supporting **30+** teams.
- Developed a **60M+ image-search engine** using **CLIP embeddings + ElasticSearch**, enabling edge-case retreival and cutting reviewer triage from **4 hours** to **10 minutes** (**95% efficiency gain**).
- Deployed an on-prem **Ollama LLM** with a Python FastAPI wrapper, enabling private, team-wide LLM access (**150+ users**) with zero external data egress.
- Streamlined **ML pipeline** provisioning on **AKS** (**Terraform, Helm, GitHub Actions, Argo**) for **multi-tenant** ADAS teams; integrated Prometheus monitoring/alerting, and reduced experiment setup from **3 days** to **5 minutes** (**99%** efficiency gain) for **30+** teams.

**Machine Learning Operations (MLOps) Intern** — Jan 2023 – May 2023 & Jun 2022 – Jul 2022
- Built on-premise **MLOps** pipeline (**DVC + MLflow**), reducing model setup time from **1 Week** to **1 Day**, **85%** faster.
- Accelerated **multi-GPU** training for YOLOv5 and Detectron2 on **Azure ML Studio**, reducing training time by **67%**.

## Projects and Publications

[1] **Code Runtime Complexity Prediction** - ERCICA (Springer), 2023 | Python, TensorFlow, sklearn, Streamlit, NetworkX
Predicted Big-O runtime complexity of C/Java/Python code using static analysis and ML classification with BiLSTM over Abstract Syntax Trees graph embeddings on IBM CodeNet dataset (**Accuracy: 96%**). [View Publication]

[2] **Sentinel-Edge AI** - MadData Hackathon 2026 (Qualcomm Track) | Llama 3.2, Langchain, RAG, FastAPI
Selected as 1 of 10 teams to build an air-gapped **Edge AI** security auditor on Snapdragon X Elite NPU; engineered a RAG pipeline with ChromaDB to detect legal risks and code vulnerabilities without cloud egress. [View Project]

[3] **MLOps POC pipeline for Pedestrian Detection** - 2023 | Python, DVC, MLFlow, DAG, Streamlit, SQLite, PyTorch
Implemented on-premise MLOps starter template with DVC + Detectron2 for end-to-end ML lifecycle.[View Project]

[4] **Novel ways of decrypting transposition ciphers**, - IEEE smartgencon, 2022 | Python, Optimization, Natural Language
Introduced cipher-breaking optimization techniques over columnar transposition ciphers. [View Publication]

## Teaching Experience

**Teaching Assistant, CS564: Database Management Systems**                    Madison, WI, USA
University of Wisconsin-Madison; Professor: Xiangyao Yu                       Jan 2026 – May 2026
Lead assignment sections, mentor students, and hold office hours to support database projects and assignments. (**SQL**, **Python**). Design and grade assignments, exams, and project rubrics; provide feedback to **200+** students to improve understanding of database design and query optimization. Assist course instructors with course logistics, and automated grading pipelines.

**Teaching Assistant, CS203: Statistics for Data Science**                    Bengaluru, India
PES University; Professors: Dr. Bharathi R, Swati M                           September 2022 – Dec 2022
Responsibilities included teaching, designing, and grading coursework, assignments, and projects. Delivered hands-on sessions on **Data Science topics** such as **hypothesis testing, statistics, and supervised ML**. Organized, managed, and served as a panelist for a Hackathon. Mentored **120+** students enrolled in the undergraduate level Data Science course.

## Presentations and Competitions

**MadData Hackathon 2026 (Qualcomm Track)**                                   Madison, WI, USA
University of Wisconsin-Madison & Qualcomm                                    Feb 2026
- Selected as **1 of 10 teams** to build privacy-first Edge AI applications on the **Snapdragon X Elite NPU**.
- Developed "Sentinel-Edge AI," an air-gapped security auditor using local **Llama 3.2**, **Langchain** and **RAG** to analyze sensitive legal/code documents with zero cloud data egress.

**3 Minute Thesis (3MT) Competition**                                         Madison, WI, USA
University of Wisconsin-Madison                                               Nov 2025
- Selected to present research on "Generating Fine-Grained Datasets for Autonomous Driving" using vision foundation models.
- Condensed technical research into a compelling 3-minute narrative for a general, non-technical audience.

## Professional Awards and Scholarships

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| **Data Engineering Department Meeting**, BGSW | Best Presenter Award/120+ team members | 2024 |
| **Data Engineering Department**, BGSW | Top Achiever Award/Ranked **1st** among 120+ Engineers | 2024 |
| **DAC Scholarship Awards**, PES University | Distinction Award for Semesters 3 to 6 | 2022-2023 |
| **MRD Scholarship Awards**, PES University | 40% tuition fee scholarship for top 20%/1100+ students | 2020 |

## Services and Volunteering Experience

**Volunteer, BGSW CSR**                                                       Bengaluru, India
Bosch Global Software Technologies                                            Oct 2023 – Mar 2025
- **Mentorship & Inclusion:** Guided candidates with disabilities in interview preparation (Youth4Jobs) and taught Computer Science fundamentals to underprivileged students.
- **Social Impact:** Assisted in agricultural initiatives where produce revenue funded monthly stipends for differently-abled individuals.
- **Animal Welfare:** Supported habitat restoration for rescued elephants and assisted in adoption drives for abandoned dogs (CUPA).
- **Community Outreach:** Created interactive educational materials for rural childcare centers and coached sports for students in government schools.

**Volunteer, CSR Club**                                                       Bengaluru, India
PES University                                                               Aug 2019 – Dec 2019
- **Infrastructure Renovation:** Participated in painting and restoring facilities at local government colleges for underprivileged students.
- **Sustainability Drives:** Led campus afforestation initiatives, planting saplings to improve green cover in barren campus zones.