OMKAR MAHESH KASHYAP

+91 7975351724 ◇ omkar.m.kashyap@gmail.com ◇ linkedin.com/in/omkarkashyap ◇ github.com/OmkarKashyap

EDUCATION

PES University — **August 2022 - April 2026**
*Bachelor of Technology in Computer Science & Engineering, **GPA 9.34/10*** — *Bengaluru, India*

RV PU College — **June 2020 - June 2022**
*Grade XII, Karnataka State Board, **Marks: 98.3%*** — *Bengaluru, India*

EXPERIENCE

Center for Data Sciences and Applied Machine Learning, PES University — **June 2024 - August 2024**
Machine Learning Research Intern — *Bengaluru, India*

- Designed and developed innovative **Hypergraph Neural Networks**, significantly improving short text classification and semantic relationship modeling. Achieved an **F1-Score of 0.83** by creating a **state-of-the-art** hypergraph model and using Weights & Biases for experiment tracking and optimization.
- Advanced multi-hop question generation capabilities by developing an innovative deep learning architecture that combines Hypergraph Neural Networks with context-aware encoders and dual decoders, enabling automated **creation of coherent questions requiring logical reasoning.**

ONGOING PUBLICATIONS

HyperASA: Exploring Hypergraphs for Aspect-Based Sentiment Analysis

- Pioneered a novel application of Hypergraph Neural Networks in Aspect-Based Sentiment Analysis, addressing limitations in traditional graph-based models by introducing hypergraphs for more accurate and nuanced sentiment analysis.
- Developed **advanced clustering techniques** to construct hypergraphs from text data, improving the representation and interpretation of multi-way aspect-sentiment relationships.
- Demonstrated **superior accuracy and interpretability** in ABSA tasks through hypergraph-based models, opening new research avenues in sentiment analysis and structural model development.

GAM Optimizer: Novel Graph Aware Momentum Optimizer approach for Graph Neural Networks (GNNs)

- Developed the Graph-Aware Momentum (GAM) optimizer, a **gradient-based algorithm** that **dynamically adapts parameter updates based on graph topology**, enhancing optimization in Graph Neural Networks (GNNs).
- Introduced graph-specific enhancements, including **degree-aware scaling and spectral regularization**, to improve efficiency and convergence in complex graph-structured tasks.
- Achieved **superior convergence rate performance** over state-of-the-art optimizers across multiple graph-based machine learning tasks, supported by **theoretical convergence guarantees using Lyapunov properties.**

PROJECTS

Personalized Learning Platform

- Developed an AI-powered platform using fine-tuned **LLM** for personalized assessments, real-time knowledge gap analysis, and adaptive content recommendations, achieving a **1.2x improvement in learning outcomes**.
- Enhanced prompt engineering and domain-specific knowledge bases with scikit-learn and Huggingface; utilized Docker for containerization, **ChromaDB for backend database management**, FastAPI for API development and **deployed on AWS EC2 instances** for scalability. Open-sourced at GitHub link.

Virtual TryOn

- Engineered a Virtual Try-On web application using React and Flask, integrating **TensorFlow for image processing**, and leveraging a NoSQL backend for efficient data management.
- Developed an interactive computer vision system for **real-time object detection and virtual clothing overlays**, creating a seamless virtual fitting experience. Open-sourced at GitHub link.

TECHNICAL SKILLS

- **Languages:** Python, C, R, C++, Javascript, HTML, SQL
- **Technologies/Frameworks:** Pytorch, Tensorflow, SQL, Spark, OpenCV, NumPy, Pandas, Linux, scikit-learn, SciPy, Git, AWS
- **Relevant Courses:** Machine Learning, Big Data, Data Structures and Algorithms, Data Science, Operating Systems, Database Management Systems (DBMS), Computer Networks, Software Engineering, Web Development, Computer Architecture

AWARDS & GRANTS

- **CNR Rao Merit Scholarship: 25% tuition fee waiver** to top 25% students at PES University — **December 2023, May 2024**
- **MRD Merit Scholarship: 20% tuition fee waiver** to top 20% students at PES University — **December 2022, May 2023**
- **State Rank 9** in Karnataka 12th grade Board exam — **June 2022**