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Abhishek Kumar

Senior Data Scientist

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Senior Data Scientist with 5+ years of experience in machine learning, computer vision, and NLP, with a Master's in Computer Science & Engineering (University at Buffalo). Proficient in Python, C++, and PyTorch. I'm currently building agentic systems to automate customer support and ticketing system. I'm seeking new opportunities to work as an Applied Scientist.

Skills

Language and Database	Python, C++, SQL, Java (familiar), MongoDB, Weaviate, MySql, Redis, ElasticSearch
Framework and Libraries	PyTorch, Unsloth, Langchain, Django, FastAPI, Transformers, OpenCV, Sklearn, Kafka, SQS, vLLM
Agents and Tools	Langraph, Google-ADK, Crew.ai, Git, Docker, Azure, AWS, Jenkins, New Relic, Grafana, Prometheus

Work Experience

Senior Data Scientist **FEB 2024 — Present**
Mobikiwk *Gurgaon, Haryana*

- **User-Ticket-Service**, Developed hierarchical AI Agents to automate user ticketing service using **Google-ADK** and **LangGraph**.
- Created MCP servers with **FastMCP** that provide context to the multi agent systems using our legacy APIs and interact with remote JIRA and Salesforce MCP tools to orchestrate ticket resolution.
- Architectured query gateway and history management services to accurately route and manage query state across sessions.
- **Vaarta-Vedh**, Developed a financial advisory chatbot using **NLP and Generative AI** that provides personalized tax and financial advice based on users earning and spending patterns and can handle multi-turn and multi-topic conversations.
- Developed **text-to-NoSQL** query generation module using LLMs, which processes 200+ unique categories/subcategories, payment methods, merchants and associated banks to create accurate NoSQL queries.
- Designed a **RAG** based **caching system** to store and query frequently asked user questions. Performed template matching with hybrid search for higher accuracy, and reduced latency by 70-80% and costs by 90%.
- Created a response generation module that uses a Llama3.2 3b model fine tuned on custom SOPs and guardrails to create structured responses. Trained with **PEFT(QLoRA)** and served using **vLLM**.
- Built an automated evaluation tool, **lens-test-suite**, to check for drifts and evaluate system responses.
- **Bank-Statement-Parser**, Developed a scalable credit card statement parsing service that uses OCR and large language models (Azure OpenAI) to extract and parse text data and send bill payment notifications to users.
- Created **FastAPI** service to consumes requests in batches from **Kafka** queues and processes them asynchronously using Asyncio.

Research Engineer **SEP 2022 — FEB 2024**
Artificial Intelligence Innovation Lab (A2IL) *Buffalo, New York*

- **Face-Morphing**, Developed an image morphing system that uses latent diffusion models (Control-Net) to generate high quality face morphs of interpolated best pair images.
- Implemented latent interpolation and **CLIP**-based scoring to optimize image generation quality.
- **Manipulation-Detection**, Developed manipulation detection system to **detect, localize, and label** tampered news articles.
- Trained a CNN model using differential images with **ResNet-50** as backbone, to detect compression artifacts with 93% accuracy.
- Utilized **NEDB-Net** to extract noise and edge-based features to localize manipulations for the tampered regions.
- Fine-tuned a custom **Yolo-v8** model to detect objects in the localized regions and label them into 18 categories.
- Engineered text-transformer tool for controlled entity and parts of speech replacements using **SpaCy** and **transformer (BERT)** models, enhancing data preprocessing for downstream AI tasks. Used **co-reference** resolution to maintain context in long texts.

Systems Engineer **FEB 2018 — AUG 2020**
Infosys *Bhubaneswar, Odisha*

- Trained a **Random Forest** model to classify independent and dependent system components with 97% accuracy.
- Built a part price prediction module using **linear regression** for refrigeration units, supporting faster data-driven quotations.
- Managed data workflows and CI/CD pipelines using **Jenkins, Git, Airflow, and PySpark**.

Education

Master of Science in Computer Science & Engineering, *University at Buffalo, New York, GPA - 3.72/4*, Masters Thesis — AUG 2023
Bachelor of Technology in Mechanical Engineering, *SRM University, Chennai, CGPA - 8.8/10* — MAY 2017

Projects

Soccer Player Re-Identification

- Developed a deep learning model using Pytorch to re-identify soccer players in broadcast videos, achieving 63% mAP.
- Trained dual-branch network with ResNet and OpenPose subnetwork as backbones to learn appearance and body part features.
- Applied bilinear pooling to fuse appearance and body part features, enhancing robustness in dynamic scenes. Technical Report

CNN-VAE Face Image Generation

- Built a CNN based Variational Autoencoder (CNN-VAE) in PyTorch to generate realistic face images, leveraging a custom dataset and latent space representations to learn meaningful facial features.