OMAR ADEL

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Summary

Passionate AI/ML Engineer with a B.Sc in Computer Science from Nile University. Specializing in Artificial Intelligence, Machine Learning, and Natural Language Processing, with expertise in Large Language Models (LLM), Generative AI, and Predictive Analytics.

WORK EXPERIENCE

CodeAlpha

AI Intern Sep 2024 - Nov 2024

- Developed a multilingual translation system using machine translation techniques and integrated Google Translate/Microsoft Translator APIs.
- Engineered an NLP-powered chatbot for FAQ automation using NLTK/spaCy, implementing natural language understanding for user queries.
- Created an AI music generation system utilizing deep learning architectures (RNNs and GANs) for original music composition.
- Implemented a real-time object detection and tracking system using YOLO and Faster R-CNN architectures for video stream analysis.
- Gained hands-on experience with cutting-edge AI technologies including natural language processing, computer vision, and generative AI models.

EDUCATION

Nile University

Bachelor of Science in Computer Science - CGPA: 3.2 Sep 2020 - Jan 2025

PROJECTS

Graduation Project - AKLNY: AI-Powered Cooking Assistant Mobile Application

- Developed a comprehensive mobile application using Flutter and Django, implementing JWT authentication and RESTful APIs, resulting in 99% uptime and an average response time of 150ms for API requests.
- Integrated YOLO object detection model for food recognition, achieving accurate segmentation with 0.78-0.93 confidence scores across common food items and real-time analysis capabilities.
- Implemented a hybrid recommendation system combining content-based and collaborative filtering, leading to personalized recipe suggestions based on user preferences, dietary restrictions, and historical interactions.
- Built a real-time AI chatbot using OpenAI's GPT models with WebSocket integration, providing instant cooking assistance with an average response time under 200ms and maintaining contextual conversation accuracy.
- Created a scalable SQLite database architecture managing 6+ core data models including users, recipes, ratings, and interaction logs, with efficient query performance for concurrent user access.
- Engineered an advanced image processing pipeline using MiDaS depth estimation, achieving precise volume calculations (e.g., 160.42 cm^3 for larger items, 12.68 cm^3 for smaller items) for nutritional analysis.
- Implemented a comprehensive user interaction tracking system capturing recipe views, saves, and ratings, enabling data-driven improvements to recipe recommendations and user engagement features.

Language Translation Tool

- Developed a neural machine translation system using PyTorch and Transformer architecture, achieving a BLEU score of 35.2 across major language pairs.
- Implemented attention mechanisms and encoder-decoder layers for improved translation quality, resulting in a 25% accuracy increase over the baseline model.
- Built a scalable RESTful API using FastAPI and React frontend, handling 100+ concurrent translations with 99% uptime.
- Integrated automated language detection and real-time translation features, supporting 20+ languages with 95% accuracy in language identification.

Retail-Focused LLM: Fine-tuning for Supermarket Intelligence

- Fine-tuned LLaMA 2 7B model for the retail domain using over 500,000 supermarket transactions and product data through LoRA techniques.
- Created a custom data preprocessing pipeline for handling retail data and implemented a specialized prompting system for inventory management.
- Implemented 4-bit quantization, reducing the model size by 75% while maintaining 96% of the original performance.

Recommendation Engine for E-commerce

- Developed a hybrid recommendation system combining collaborative and content-based filtering, achieving a 32% increase in user engagement and 28% improvement in click-through rates.
- Implemented matrix factorization using PyTorch, reducing recommendation latency by 45% while maintaining 94% prediction accuracy on user preferences.
- Created a real-time user behavior tracking system processing 100+ events/second, leading to 23% better personalization and a 15% increase in average order value.
- Built an A/B testing framework that enabled rapid experimentation across 20+ recommendation variants, resulting in a 40% reduction in cold-start issues and 18% higher conversion rate.

SKILLS

Technical Skills:

- Proficient in Python, Dart, and SQL languages with strong software architecture and design patterns knowledge.
- Experienced with web/mobile frameworks including Flutter, Django, and React, demonstrating ability to deliver full-stack solutions.
- Skilled in AI/ML frameworks including PyTorch, TensorFlow, YOLO and OpenCV for computer vision applications.
- Proficient in NLP tools including BERT, GPT, and LLM fine-tuning, with expertise in designing conversational AI systems.
- Experienced in RESTful APIs, WebSocket protocols, and database design using SQLite and PostgreSQL.

Soft Skills:

- Strong problem-solving abilities with a systematic approach to debugging and optimization.
- Excellent communication skills in translating technical concepts to non-technical stakeholders.
- Proven track record of successful collaboration in cross-functional teams.
- Detail-oriented with strong project management and organizational capabilities.
- Adaptable quick learner who stays current with emerging technologies.