ASHUTOSH BARKULE

Machine Leaning Engineer

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OBJECTIVE

Machine Learning Engineer with **4+ years** of experience in **training Deep Learning models** across **2D and 3D Computer Vision** domains, specializing in **developing and optimizing LLM-powered agents**. Proven ability to support the research and development of innovative techniques, striving for excellence and advancement in the field.

SKILLS

PyTorch LLM Agents OpenCV Deep Learning 2d & 3d Computer Vision TensorFlow

Python Linux CUDA Wandb AWS/Azure ArcGIS DreamBooth Prompt Engineering

EXPERIENCE

01/2021 – NOW

Chennai, TN

Machine Learning Engineer – Deep Learning

MavenAI - (Startup)

3D Semantic Segmentation and Object Extraction Expertise

- **Innovative Model Development**: Leveraged Kernel Point Convolution (KPConv) capabilities within PyTorch to design a tailored 3D object detection model.
- **Data Fusion**: Combined 3D data from LiDAR with regular 2D pictures to make the tool more accurate in finding objects.
- **Rigorous Data Validation**: Employed CloudCompare software for meticulous annotation and validation of point cloud datasets, ensuring a robust foundation for model training.
- **Advanced Extraction**: Post-model inference, adeptly pinpointed objects in fresh datasets and their exact geo-coordinates.
- **Post-Processing Excellence**: Managed tasks like removing objects from data and fine-tuning details to meet the project's goals after the tool has made its guesses.

2D Computer Vision Expertise (Object Detection & Segmentation)

- **Collaborative Strategy**: Worked hand-in-hand with the CEO to define and execute the vision for the company's advanced AI solutions.
- **Versatile Model Training**: Proficiently trained and optimized cutting-edge models including Detectron2, YOLO, and SSD for tasks in 2D object detection and instance segmentation.
- **Automated Annotation**: Designed and rolled out an automatic image annotation tool, enhancing the speed and uniformity of data preparation.
- **Optimization and Monitoring**: Leveraged "WandB.ai" to methodically manage and fine-tune diverse model configurations, ensuring top-tier performance metrics.
- **Focused Team Leadership**: Directed and upskilled a dedicated annotation team, prioritizing high fidelity in annotated data production for 2D visual tasks.

- **Advanced Techniques**: Implemented model pruning strategies for efficient deployment and executed mask extraction techniques for enhanced blueprint mapping applications.
- **Client Commitment**: Successfully cemented a partnership through a signed **Memorandum of Understanding (MOU)**, underscoring the project's significance and direction.

Large Language Models (LLM's) Agents Specialist

- **Agent Development & Optimization**: Designed and deployed specialized LLM-driven agents, including **RFI Agents**, **HR Agents**, and **Marketing Agents**, enhancing automation and efficiency in business operations.
- **Intelligent Retrieval & Automation**: Engineered robust information retrieval pipelines, enabling **seamless and accurate** extraction of structured insights from extensive datasets.
- **Framework & Toolkit Expertise**: Leveraged advanced frameworks such as **LangChain and OpenAI tools** to optimize agent workflows, ensuring high responsiveness and contextual accuracy.
- **Custom AI Solutions**: Tailored AI-driven solutions to specific business functions, integrating **adaptive learning** techniques for continuous improvement and relevance.
- **Industry Innovation & Research Alignment**: Actively incorporated emerging trends and research findings to refine **LLM agent capabilities**, driving state-of-the-art advancements in automation and **AI-driven decision-making**.

Custom AI Model Development using DreamBooth

- Developed and **fine-tuned** custom **generative AI** models using the **DreamBooth** technology.
- Specialized in generating varied artistic renditions of **self-images based** on specific prompts while maintaining the distinct **facial features** of individuals.
- Demonstrated proficiency in machine learning, with a focus on personalized **image generation and style adaptation**.
- Utilized advanced techniques to ensure the model's adaptability in generating images across **diverse artistic styles** while preserving the accuracy of **individual facial characteristics**.

EDUCATION

2019 – 2022

Pune, MAH

MASTER OF COMPUTER APPLICATION

Sinhgad Institute of Management

2016 – 2019

Pune, MAH

BACHELOR OF COMPUTER SCIENCE

Sinhgad Collage of Science

CERTIFICATION

Microsoft Azure Fundamentals (AZ-900), Microsoft.

- Acquired fundamental knowledge in cloud services and Microsoft Azure, focusing on cloud concepts, core Azure services, security, and privacy.