Kartik Bharat Sonaghela

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TECHNICAL SKILLS

- **Programming Languages**: Python, SQL
- **Databases**: MySQL, MongoDB
- **Frameworks**: PyTorch, LangChain
- **DevOps, Cloud & Misc.:** Docker, Git, Postman
- **Data-Science & AI**: Machine Learning, Deep Learning, NLP, RAG

EXPERIENCE

Data Scientist, DeepNeura Technologies   May 2022 – Present | Mumbai, India

Crop Trend Prediction:

- Developed a crop price prediction system using agricultural data from Agmarknet.
- Cleaned and pre-processed data, handling missing values and selecting key features for optimal performance.
- Fine-tuned model parameters to enhance accuracy and prediction reliability.
- Utilized the XGBoost algorithm to forecast crop prices for the upcoming 10 days, aiding farmers in decision-making.

Chatbot Development:

- Created a RAG-based application for Bayer, utilizing large language models to answer questions and provide support to farmers.
- Leveraged LangChain framework, MongoDB vector database with GPT-4o-mini model to build an interactive chatbot, handling diverse queries.
- Designed the chatbot to support multi-language communication, responding in any Indian language or English, and improved communication and decision-making for farmers by delivering tailored responses based on Bayer's internal data.

Jr Data Scientist, Care Risk Solution   March 2021- April 2022 | Mumbai, India

- Developed an Auto-ml Software which include entire machine learning cycle life starting from uploading data to predicting the data.
- Text Summarization of scrapped news article into 200 words.
- Created a covid dashboard using Tableau during second wave which shows information regarding vaccination, how many are positive and how many have recovered.

PROJECTS

Language Translation Using Transformer Architecture

- Developed an English to Hindi translation model from scratch using Transformer architecture in PyTorch, trained on 200,000 sentences from Kaggle.
- Implemented key components such as multi-head self-attention, positional encoding, multi-cross encoding, layer normalization, and feed-forward networks as described in the "Attention Is All You Need" paper.

GPT-2 Model for Hindi Lyrics Generation

- Developed a custom GPT-2 model using Karpathy's implementation, focusing on Hindi lyrics.
- Trained on 10,000 Hindi Bollywood lyrics with 124M parameters and 300k tokens, generating coherent text.
- Implemented the model with 12 decoder layers for deeper language understanding and used the GPT-2 tokenizer to effectively train on diverse Hindi lyrics, leveraging PyTorch for advanced NLP and deep learning capabilities.

Instruction Fine-Tuning of LLaMA 3.1 Model

- Performed supervised fine-tuning on a 4-bit quantized LLaMA 3.1 8B model using the FineTome dataset, focusing on instruction fine-tuning with 1,000 rows of question-answer pairs.
- Utilized the Unsloth library with the QLoRA method to perform supervised fine-tuning on 42 million parameters out of 8 billion, enhancing the model's ability to understand and respond to instructions efficiently.

EDUCATION

University of Mumbai   **Aug 2016 – Oct 2020**
Bachelor of Engineering in Computer Engineering   Mumbai, India