**Kartik Bharat Sonaghela**

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# TECHNICAL SKILLS

* **Programming Languages**: Python, SQL
* **Databases**: MySQL, VectorDB
* **Frameworks**: PyTorch, LangChain
* **DevOps, Cloud & Misc.:** Docker, Git, Postman, Flask, CI/CD, AWS,Mlops
* **Data-Science & AI**: Machine Learning, Deep Learning, NLP, RAG, GenAI, LLMs, Fine-Tuning, AI-Agents

# EXPERIENCE

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

# ****Crop Trend Prediction**:**

# Developed a crop price prediction system using agricultural data from [Agmarknet](https://agmarknet.gov.in/).

# 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 scraped news article into 200 words.
* Created a covid dashboard using Tableau during the second wave which shows information regarding vaccination, how many are positive and how many have recovered.

**PROJECTS**

# YouTube Comment Sentiment Analysis Chrome Extension

* Developed a Chrome extension to analyze YouTube comment sentiment in real time, providing insights into audience reactions.
* Utilized MLflow for experiment tracking, DVC for dataset versioning, and built a XGBoost model with TF-IDF vectorization, SMOTE, and Optuna for hyperparameter tuning to ensure accurate sentiment classification.
* Deployed the backend using Flask APIs in Docker containers on AWS (S3, CodeDeploy, ECR), integrating with the Chrome extension frontend built with HTML, CSS, and JavaScript.

**Fine-Tuned Llama for Indian laws**

* Fine-tuned a 3.18B-parameter LLaMA 3.1 model on 35K legal records, including BNS sections and public laws, to enhance legal understanding.
* Constructed the dataset with instruction, input, and simplified explanations generated by the Gemma 2.0 flash model to demystify complex legal jargon.
* Optimized inference using the vLLM framework on an L4 GPU after fine-tuning model on an A100 GPU for 6 hours, enabling users to ask legal questions and understand legal documents like FIRs.

**AI Code Assistant**

* Developed a VS Code extension for code generation by fine-tuning the Phi-3 4-bit quantized model on the iamtarun/python\_code\_instructions\_18k\_alpaca dataset using LoRA with the Unsloth library.
* Optimized a small language model (SLM) for local execution, enabling efficient and accurate Python code generation within VS Code.

# EDUCATION

# University of Mumbai Aug 2016 – Oct 2020

Bachelor of Engineering in Computer Engineering Mumbai, India