

# Why and What is Finetuning LLMs?

## Instructor

Sourab Mangrulkar

Machine Learning Engineer at 

Creator of  PEFT



# What is Finetuning?



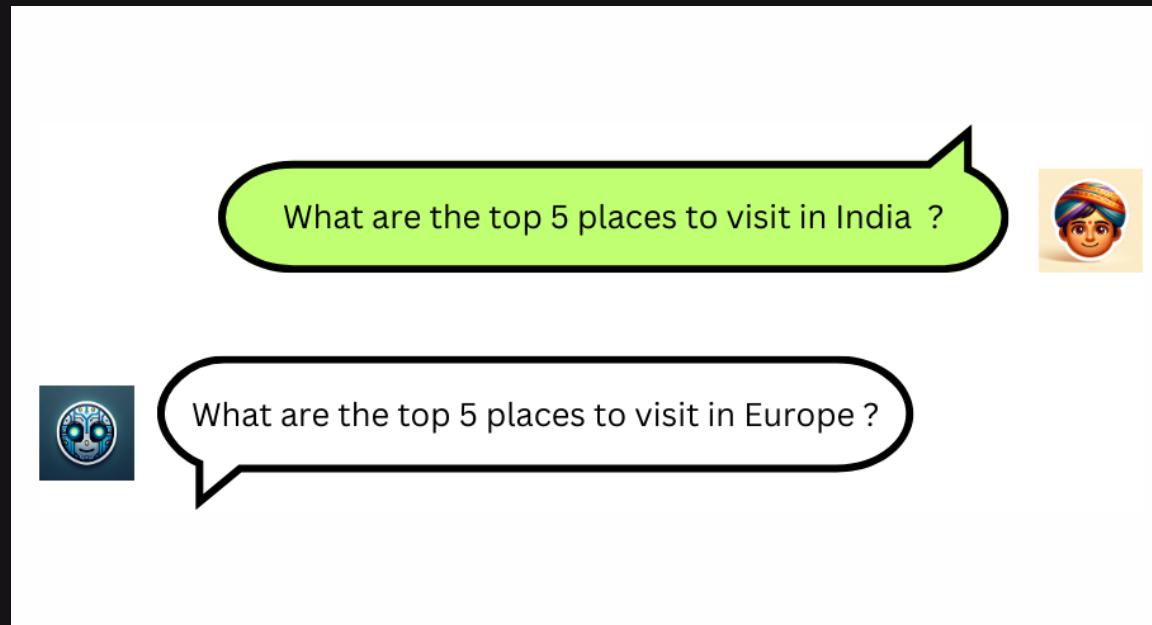
Adapting pre-trained general-purpose model by training it further to:

- specialize at given task(s) by gaining domain knowledge
- change model behaviour to provide consistent outputs and better control the tone and style of the outputs
- Align model to be helpful, harmless and honest

# Why Finetuning?

Recipe for getting state-of-the-results in Natural Language Processing (NLP) domain:

- \* Pretraining on web-scale datasets
- \* Finetuning on downstream task of interest



Base Model



Finetuned Model

# Prompt Engineering VS Finetuning

## Prompt Engineering

- Using carefully crafted prompts to guide AI responses
- Low cost upfront. No need for additional training or data.
- User-friendly as it doesn't require technical knowledge
- Less Customizable as there is a limit to what one can fit in a prompt. Limited to capabilities of pre-trained model
- Accuracy and consistency of outputs is lower. Suits rapid prototyping, POCs and generic domains

## Finetuning

- Training further on task specific datasets to tailor its responses
- Higher cost upfront. Involves costs for training data and computation.
- Requires technical knowledge
- Highly customizable. Can tailor the model to specific needs. Change the behaviour and gain knowledge for specific task(s)
- Accuracy and Consistency are high. Suits Enterprise, production and domain specific use cases.

# Advantages of Finetuning

Performance

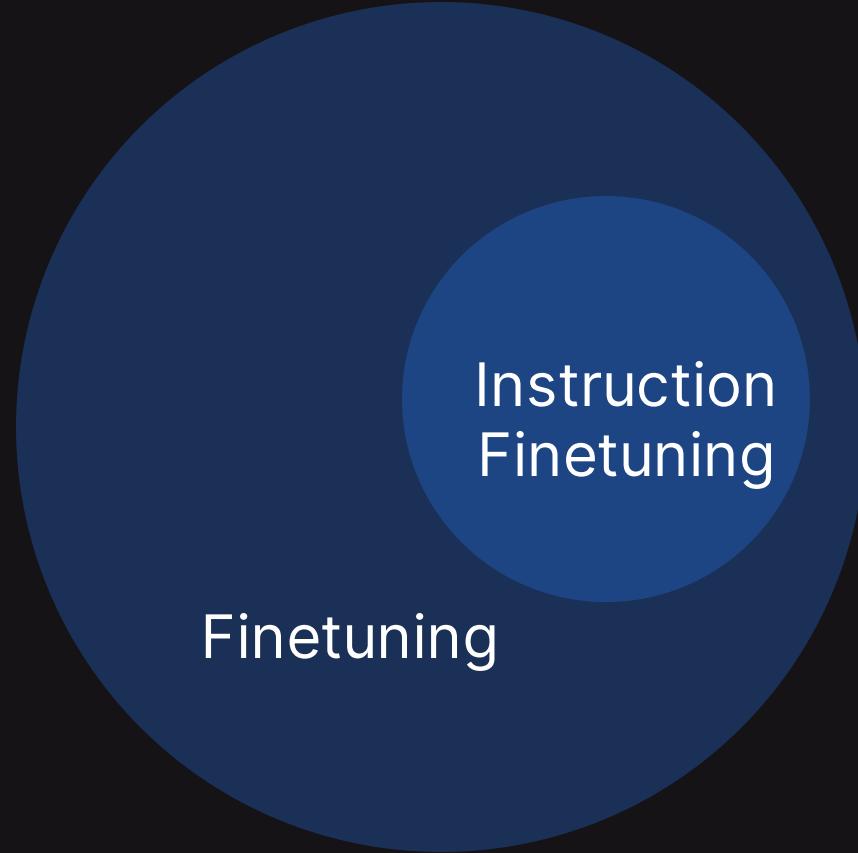
Data Privacy and Security

Lower operational costs, Scalability and Reliability



# What is Instruction Finetuning?

Training language models to follow instructions with human feedback (OpenAI Paper)



Training pre-trained LLMs to follow instructions

- Dataset - (Instruction, Inputs, Response) tuples
- Answer/mimic like a human in order to behave like a chatbot
- ChatGPT, SharChat, Zephyr