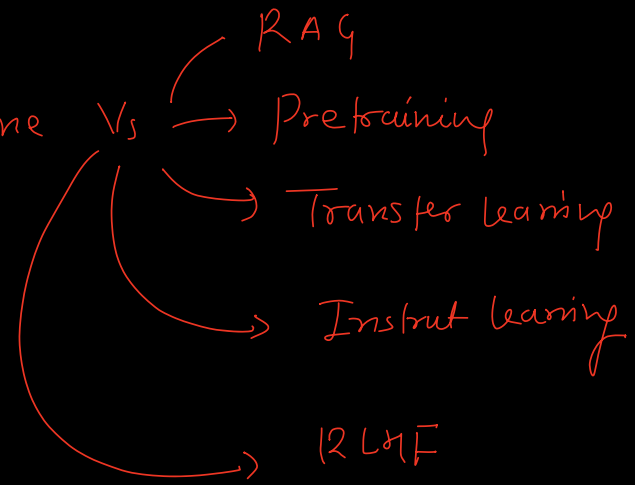
# Fine Tunning.

(1). Campaision →




(2). What is Finetuning.

Why ? → (3).

(3) → When ? → ideal - 1)
2)
3)

(4). Challenges → Finetuning - (3)

(5) → Process - 5-6 →

(6) → Types → 1)
2)
4)
4)

(7) → Technique ⇒ 1
2
3
4

(8) → Application →

(9) → Evaluation - ? →

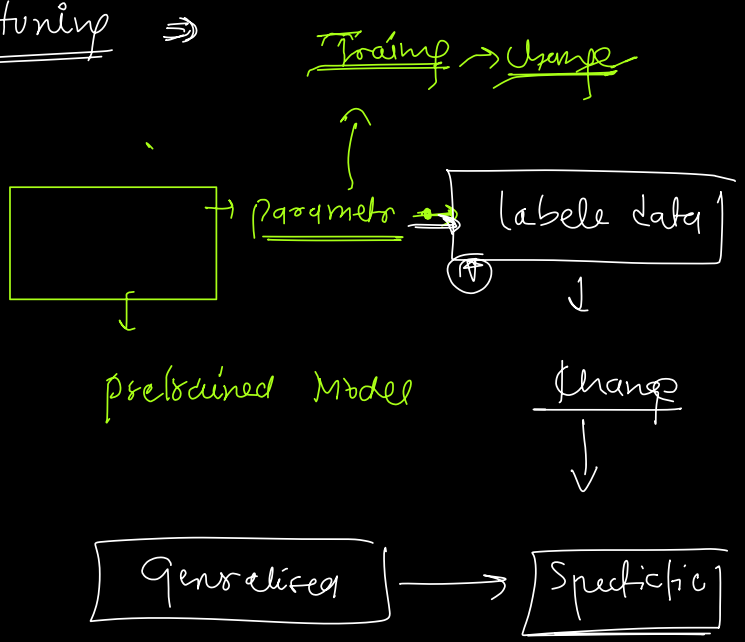
(10) → Frameworks? — (1)
(2)
(3)

(11, 12) → Emerging Trends ⇒ 11
21

3)

⑬ - if fine tune → what ?

① ⇒ Fine tuning ⇒




Purpose ⇒ To convert generalised Model into specific Model based on given data.

② When :

① Model → Not able to Answer as per your domain-specific.

② → Hallucinated Answer

③ Accuracy ↓

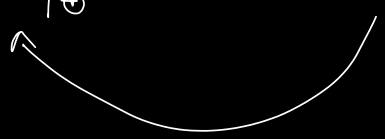
④ Multilingual .

③ → Challenges :

(1). Handling Specified Vocabulary.

(2) → Training Time Reduce → Hardware

(3). Overfitting → Dataset Small



(4) → Data Drifting problem →

(5) → Balancing B/w Generalized Models to specific Models.

Process :→ 1) Selet one pre-Trained Model.

2) Prepare Task specific Data

(3) → Adjust Model Paramaters.

(4) → Set Hyperameter

(5) → Validate peeformance :→

(6) → Deploy / use.

2.

(1) Data preprocessing ⇒ Labels.

(3) → Overfitting, Overshooting, slow convergence.

(3) → Validation → Cross Validation

Types :- ⇒ 1) Full Fine tuning.

2) Feature Base/ Feature Extration

3) PEFT ( Parameter Efficient Fine Tuning)

(4) Task specific Fine Tunning.

0

① Full Fine Tuning :- Update all the layers of parameters.

② Feature Extraction →

- earlier layer → Freeze
- last layer → update (Trained)

↓

Task specific Finetuning

③ PEFT → Parameter Efficient Fine Tuning

↓ ↓

Ranking

Low Rank Adaption

1) Memory
2) Power
3) Time
4) Accuracy

↳ LORA → Low Rank Adaptation

→ Quantization (

Memory → Reduce (32-8 bit)

(*)

(4) → Task-specific Finetuning ⇒ Summarization ,

↳ ⇒ classification .

(1) →

(1) Finetune

1) Model Training on specific data

*2) More data

RAG

⇓

Information Retrieval from ten specific data 2) Less data

(2) Finetune (*)

On → Pre trained Model

* Model

(*) Pretraining .

Before Training any Model ↓

Architecture

(3) → Fine tune →

(1) Layer Freeze Training & parameter Updation

Instruction Training.

document labelled data

Q - A

↓

4) Fine Tunning

Transfer learning.

① Paramet updation

① Parameter sharing

② Fine tuning

↓

Supervised Task (Data)

RLHF (

Reinforcement learning with Human Feedback.

↓

Feed back

Evalution:

1) ROUGE → Recall

2) BEUU →

3) Perplexity →

Trends: ① Instruction Based Finetuning.

② Larger Context Window

* Integrate with RAG (Accuracy)

Techniques: 1) Adapters → · Frozen layer

2) LoRA

3) Q-LoRA

4) Few shot Learning.

5) Zero Shot Learning

Responsible AI: AI It Should go Against the Human.

↓ → Set Rule for AI → Responsible AI

* Human → set of Rule → Consitiution

↳ Dream

* Ex → Homework → Repeat

Responsible → { Google → Pie }

Green AI → AI → Model

↓

Computional Energy

↓

Fuel, electricity, Solar

↓

Climate Effect ← electric

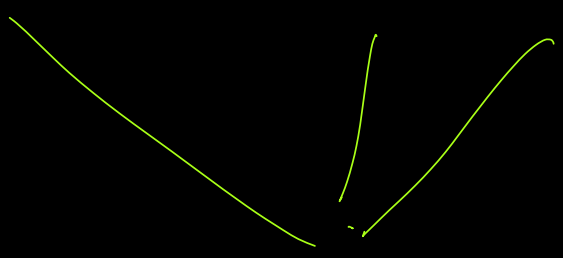
② Nvidia → Latest → Mine

↓

Chips

↓

Temperature / Bio diversity / Environment



Cop

Environment ← Effect — Environment