

## Natural Language Processing



### Adaptation

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## Adaptation

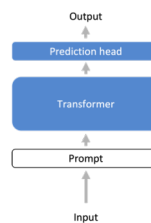
## Challenges

- Task Format
  - **Premise:** I have never seen an apple that is not red.
  - **Hypothesis:** I have never seen an apple.
  - **Correct output:** Not entailment
- Harm Mitigation / Control
- Domain Shift
  - e.g. biomedical text, legal text
- Temporal Shift
  - Updated facts, news, etc.

## Methods

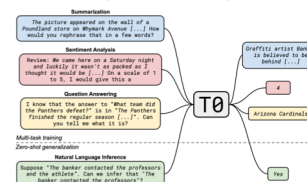
- Finetuning
- Lightweight Finetuning
- Prompting

## Finetune

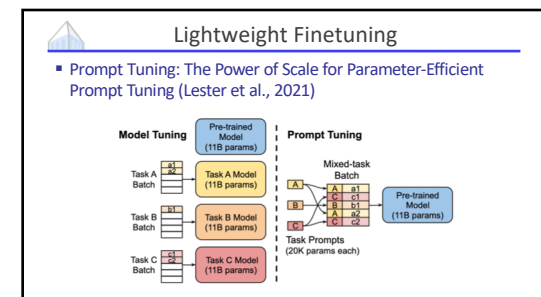
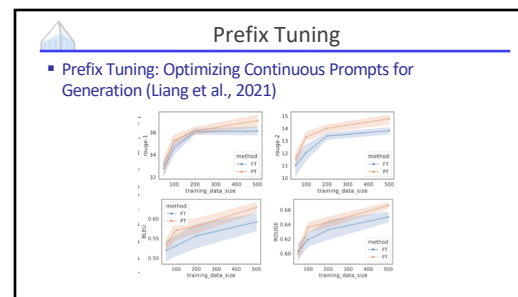
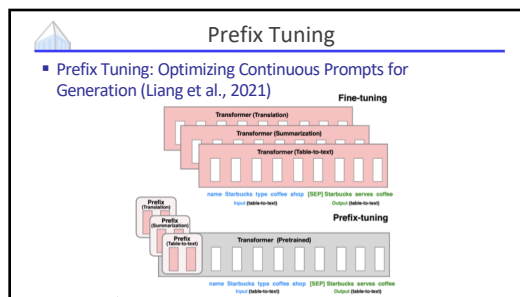
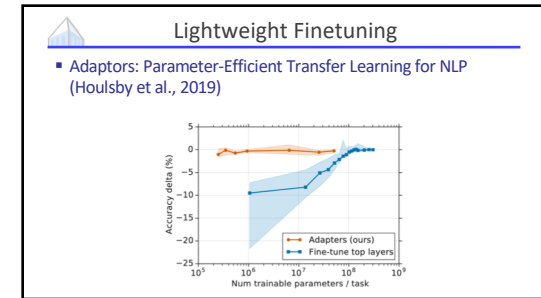
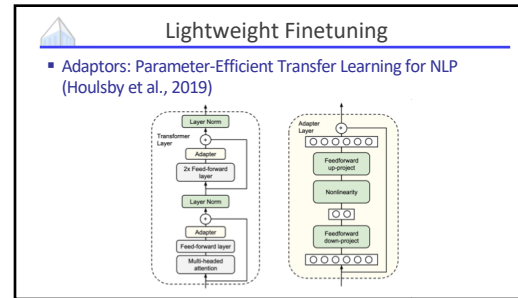
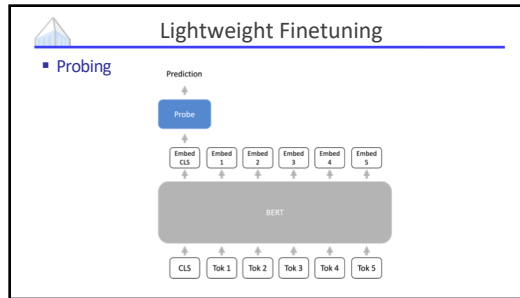


## Finetuning for Zero-Shot / Instructions

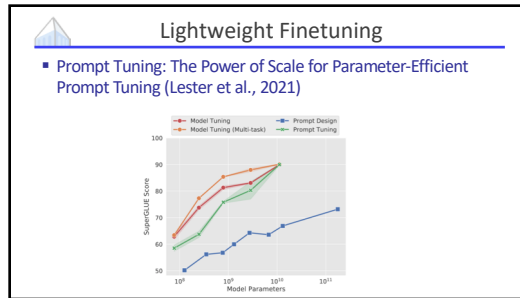
- Multi-task Prompted Training Enabled Zero-Shot Task Generalization (Sanh et al., 2022)







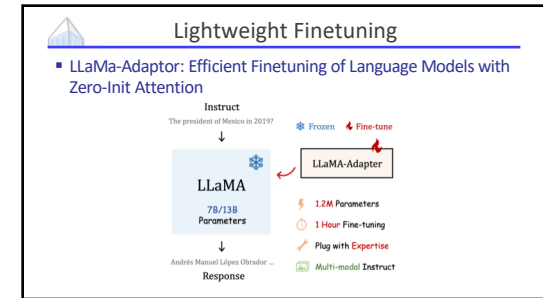




### Lightweight Finetuning

- Lightweight finetuning improves OOD results

Dataset	Domain	Model	Prompt	$\Delta$
SQuAD	Wiki	$94.9 \pm 0.2$	$94.8 \pm 0.1$	-0.1
TextbookQA	Book	$54.3 \pm 3.7$	$66.8 \pm 2.9$	+12.5
BioASQ	Bio	$77.9 \pm 0.4$	$79.1 \pm 0.3$	+1.2
RACE	Exam	$59.8 \pm 0.6$	$60.7 \pm 0.5$	+0.9
RE	Wiki	$88.4 \pm 0.1$	$88.8 \pm 0.2$	+0.4
DuoRC	Movie	$68.9 \pm 0.7$	$67.7 \pm 1.1$	-1.2
DROP	Wiki	$68.9 \pm 1.7$	$67.1 \pm 1.9$	-1.8



### Prompting

- Zero-Shot

```
Text: i'll bet the video game is a lot more fun than the film.
Sentiment:
```

Copy

### Prompting

- Few-Shot

```
Text: (lawrence bounces) all over the stage, dancing, running, sweating, mopping his face and
Sentiment: positive
Text: despite all evidence to the contrary, this clunker has somehow managed to pose as an act
Sentiment: negative
Text: for the first time in years, de niro digs deep emotionally, perhaps because he's been st
Sentiment: positive
Text: i'll bet the video game is a lot more fun than the film.
Sentiment:
```

### Prompting

- Calibrate Before Use: Improving Few-Shot Performance of Language Models (Zhao et al., 2021)

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