Parameter-Efficient Transfer Learning for NLP

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Google AI

Imagine doing Transfer Learning for NLP

Ingredients:

- A large pretrained model (BERT)
- Fine-tuning

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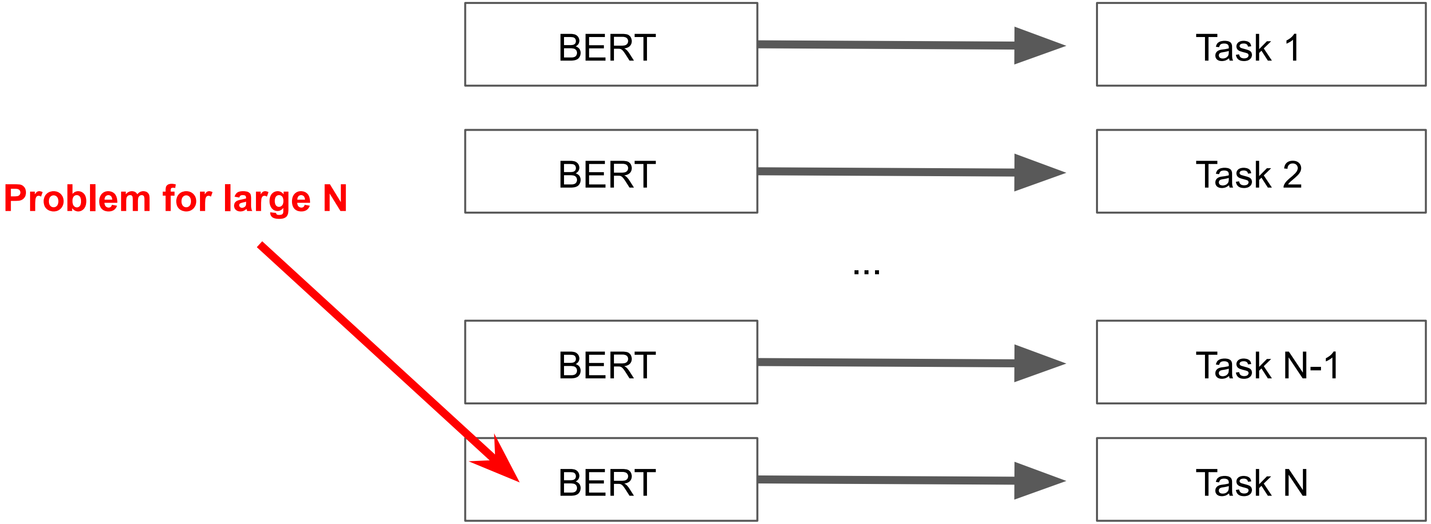

BERT → Task 1

BERT → Task 2

...

BERT → Task N-1

BERT → Task N

Problem for large N

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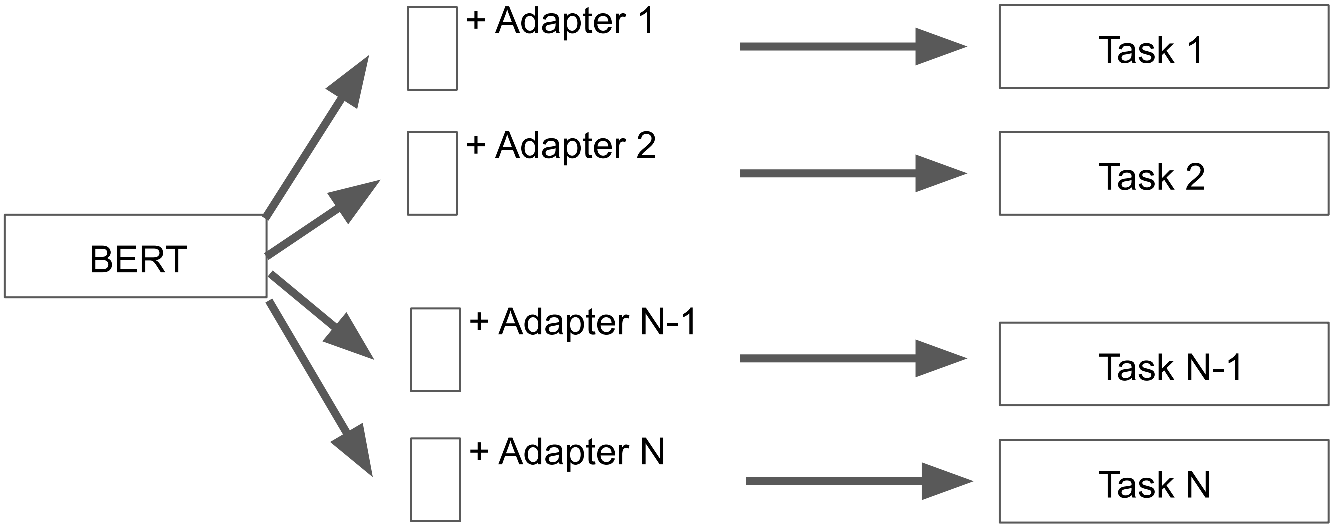
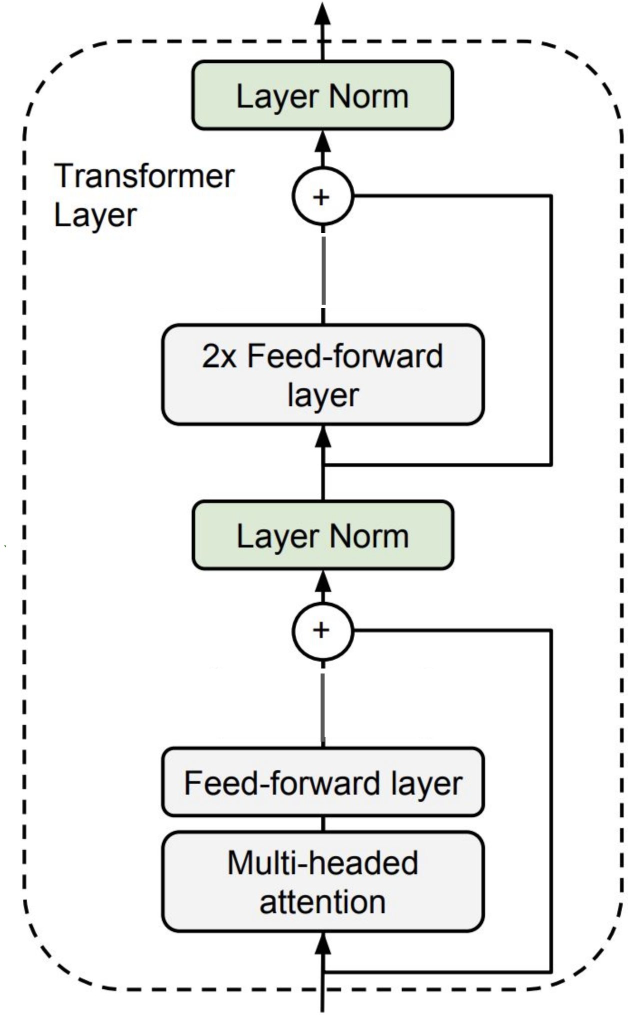


BERT + Adapters

- **Solution**: Train tiny adapter modules at each layer



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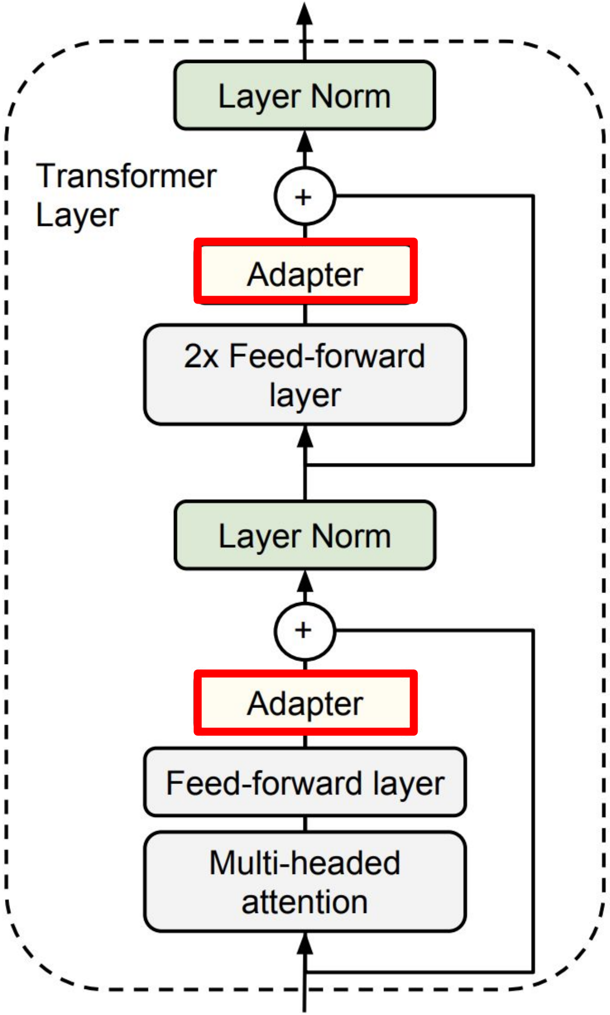

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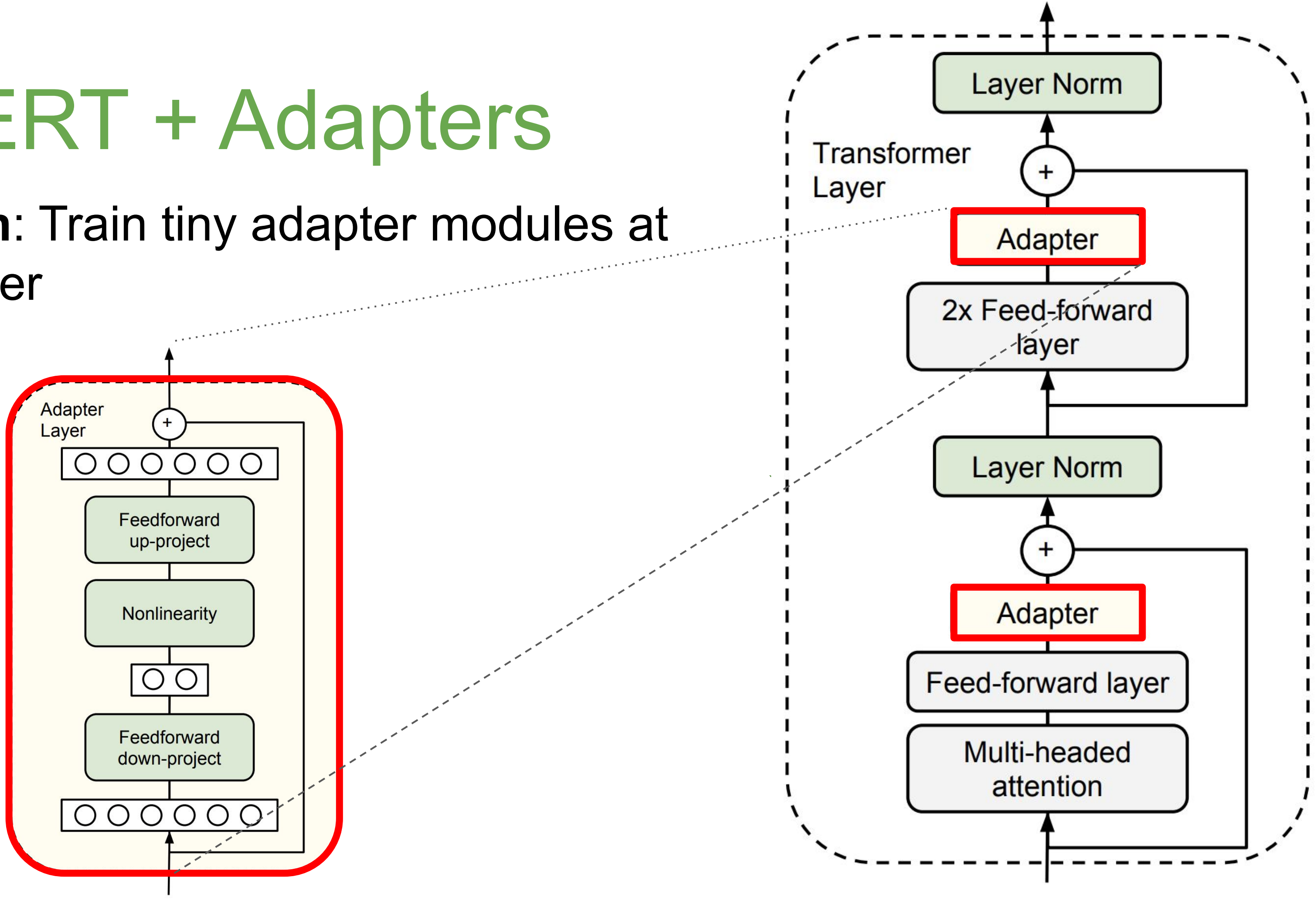

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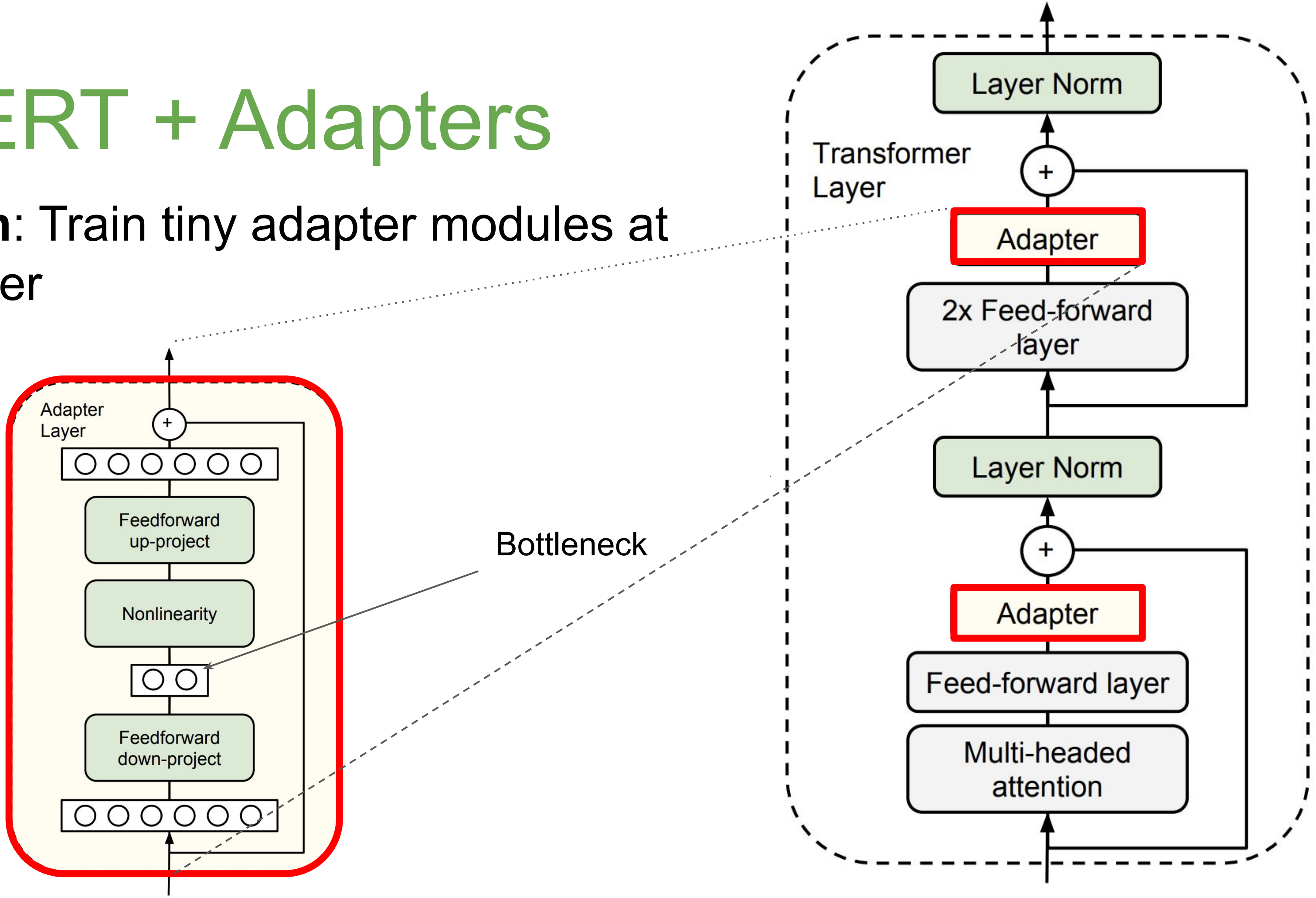
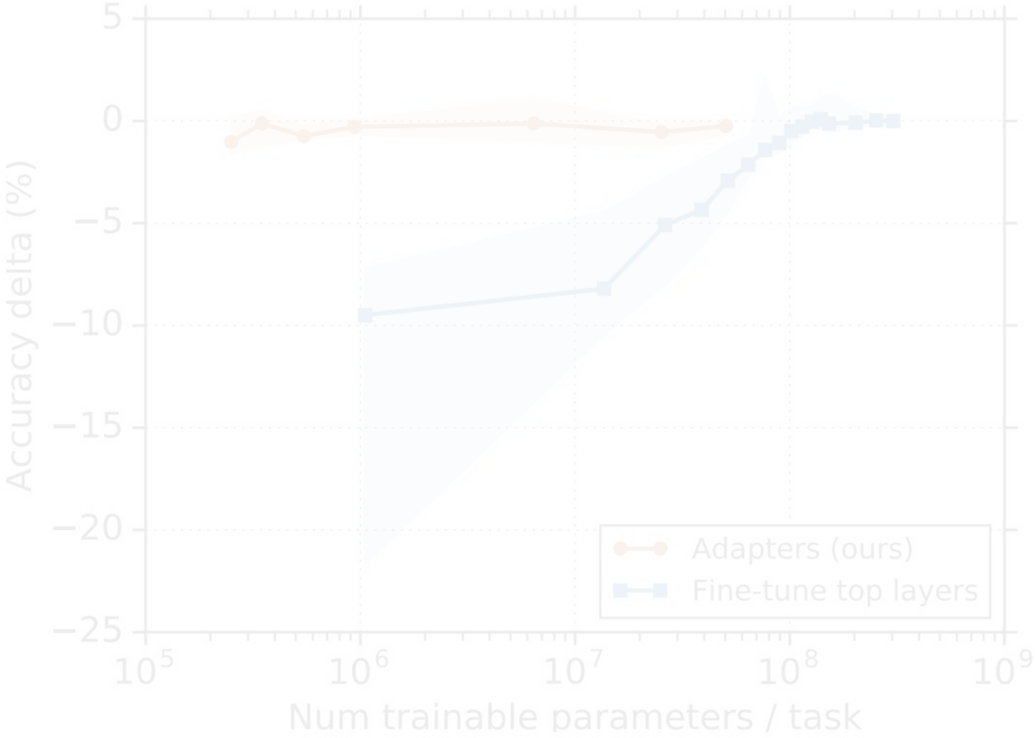


Results on GLUE Benchmark



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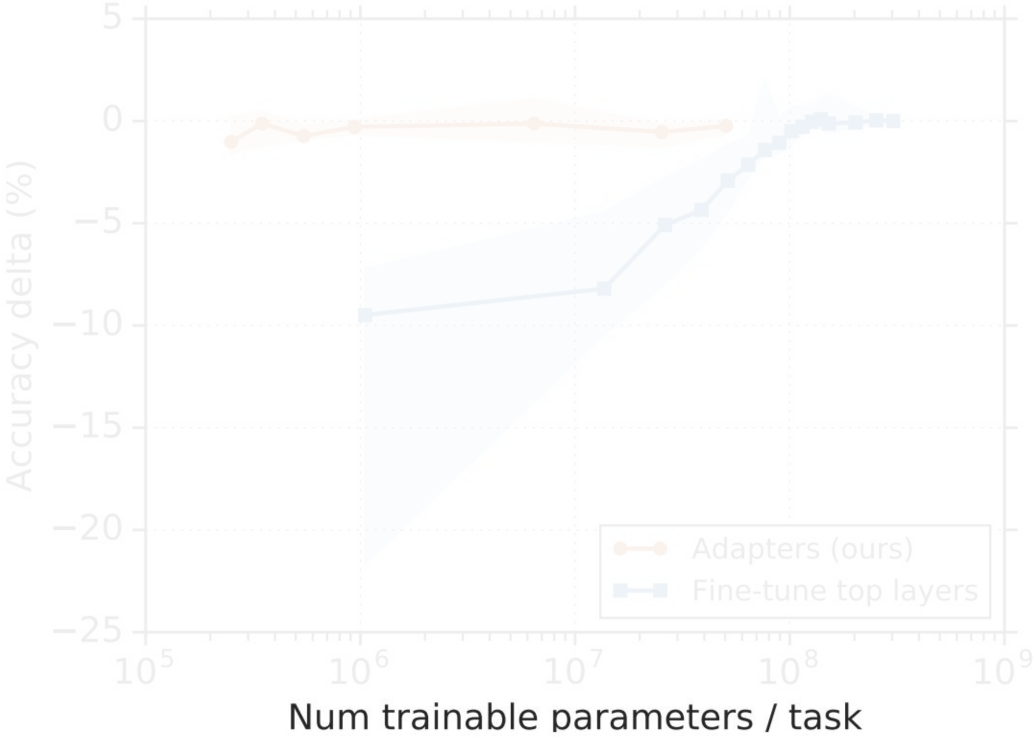

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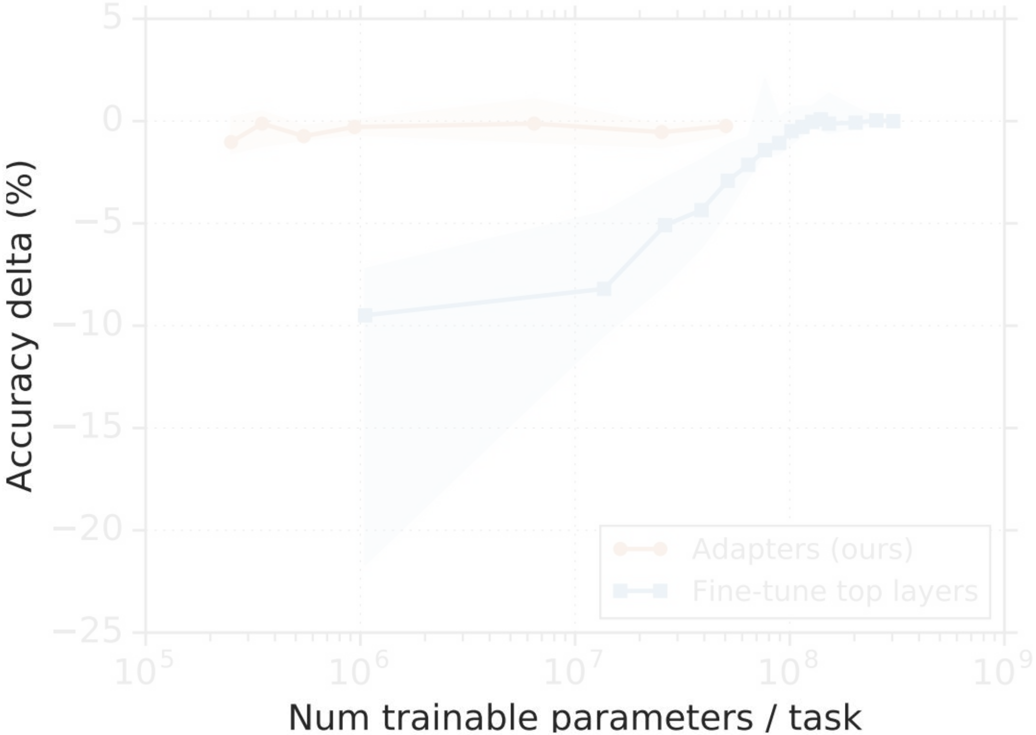
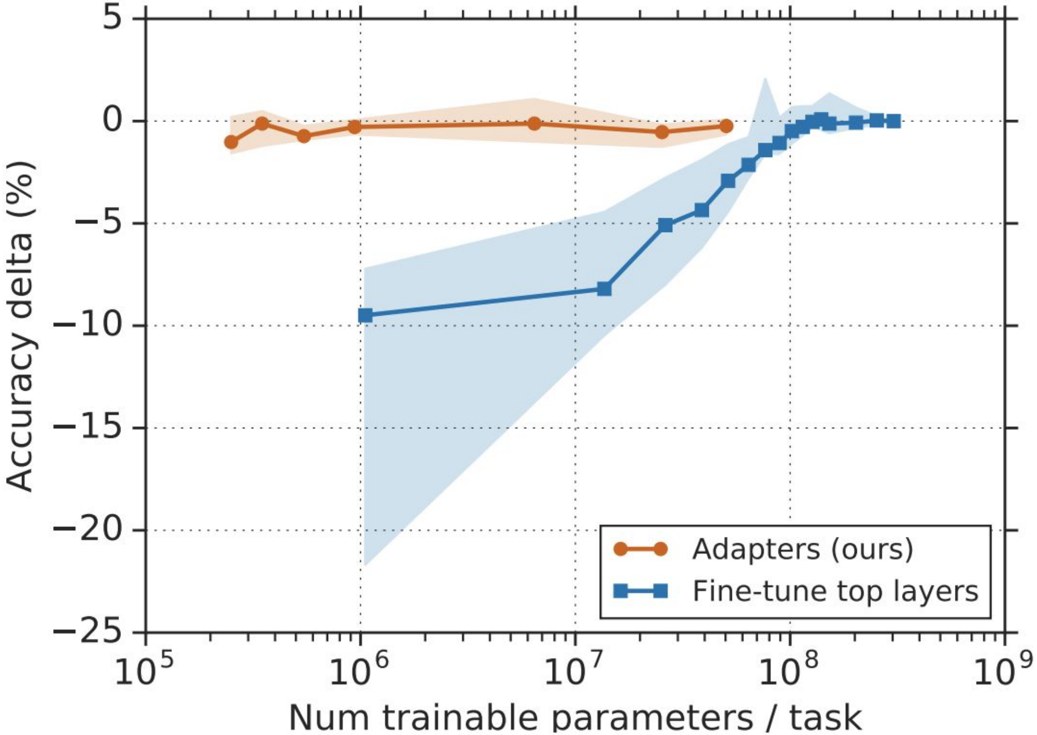


Results on GLUE Benchmark



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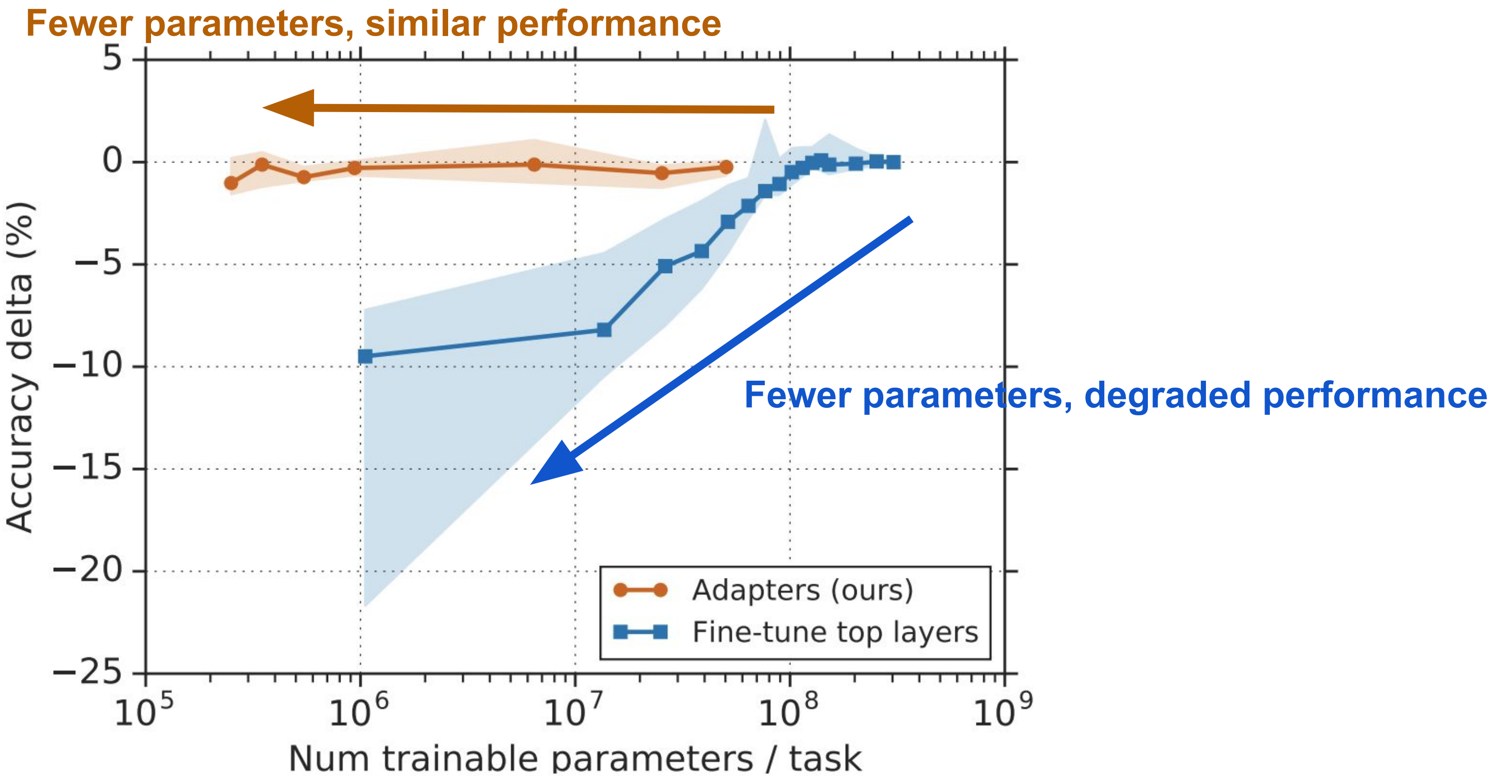
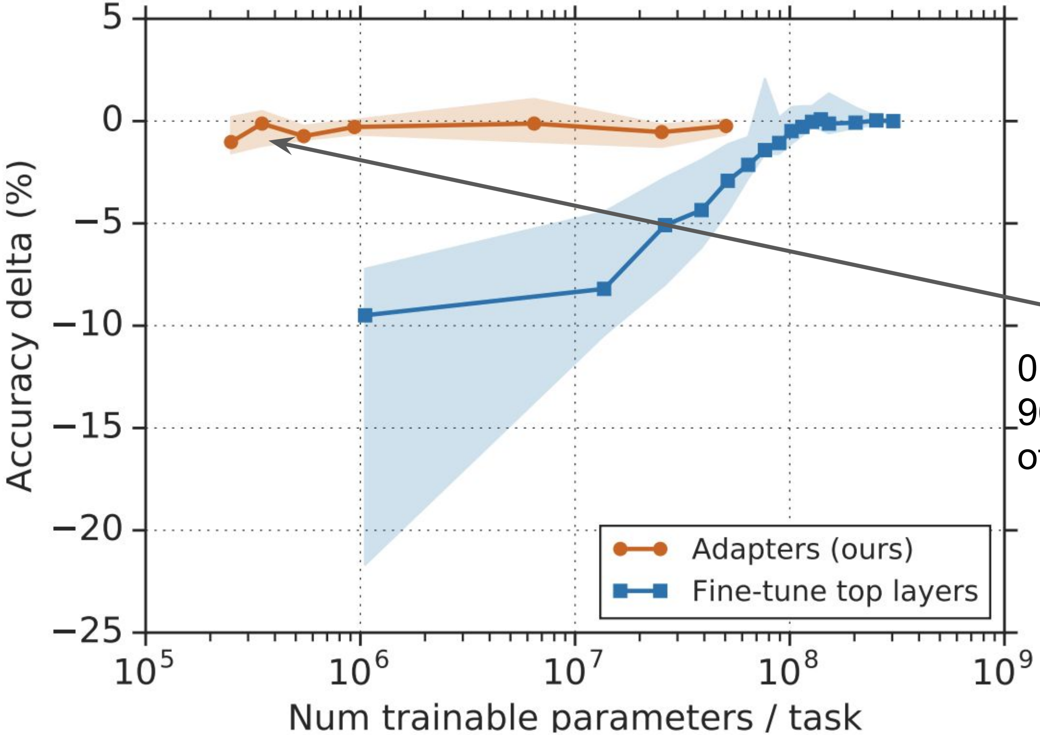


Fewer parameters, similar performance

Fewer parameters, degraded performance

Results on GLUE Benchmark



0.4% accuracy drop for 96.4% reduction in the # of parameters/task

GREAT DEAL ★★★★★ GREAT DEAL ★★★★★ GREAT DEAL

Conclusions

1. If we move towards a single model future, **we need to improve parameter-efficiency of transfer learning**
2. We propose a **module reducing drastically # params/task for NLP**, e.g. by 30x at only 0.4% accuracy drop

Related work (@ ICML): ***"BERT and PALs: Projected Attention Layers for Efficient Adaptation in Multi-Task Learning", A. Stickland & I. Murray***

Please come to our poster today at 6:30 PM (#102)