



THE UNIVERSITY OF
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DEPARTMENT OF STATISTICS

MASTER'S THESIS PRESENTATION

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Hidden State Variability of Pretrained Language Models Can Guide Computation Reduction for Transfer Learning

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ABSTRACT

While transferring a pretrained language model, common approaches conventionally attach their task-specific classifiers to the top layer and adapt all the pretrained layers. We investigate whether one could make a task-specific selection on which subset of the layers to adapt and where to place the classifier. The goal is to reduce the computation cost of transfer learning methods (e.g. fine-tuning or adapter-tuning) without sacrificing its performance.

We propose to select layers based on the variability of their hidden states given a task-specific corpus. We say a layer is already "well-specialized" in a task if the within-class variability of its hidden states is low relative to the between-class variability. Our variability metric is cheap to compute and doesn't need any training or hyperparameter tuning. It is robust to data imbalance and data scarcity. Extensive experiments on the GLUE benchmark demonstrate that selecting layers based on our metric can yield significantly stronger performance than using the same number of top layers and often match the performance of fine-tuning or adapter-tuning the entire language model.