New Techniques for Improving Transfer Learning
Outline

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Background

• **Transfer Learning (TL)**

Transfer learning (TL) is a recent research problem in deep learning (DL), which focuses on applying obtained knowledge from one problem to a different but related problem.

1. **Freezing/Feature Extractor:**
   Freeze the weights learnt from the source tasks except for the last classification layer.

2. **Fine-tuning:**
   Most of the weights learnt from the source task are retained and updated to fit the target task.
Background

• **Standard Paradigm of TL**

1. *Yosinski’s approach:*
   Freeze the weights in the layers which extract ‘general’ features, fine-tunes the weights in the layers which extract ‘specific’ features. (Yosinski et al., 2014)

2. *Standard approach:*
   Transfer and fine-tunes all the weights.
Background

• **SpotTune**

A way of adaptive fine-tuning. By using SpotTune, NN can find them optimal fine-tuning strategy per instance for the target data. (Guo et al., 2018)
Motivation

• **No golden rules or a perfect paradigm**
The number of layers to be transferred still depends on the similarity between source and target tasks. Transferability is still problem-based or problem-dependent.

• **SpotTune**
SpotTune is also not a perfect solution to fit every task in TL. There are some flaws in its algorithm and the method can be improved in several ways.
Objectives

• **Research on recent state-of-the-art techniques related to TL**
  Study and apply these techniques to improve the performance of TL.

• **Analyze and compare the results with SpotTune**
  The performance of SpotTune will be taken as the baseline. The results will be compared with the performance of SpotTune.
Q&A

Any Questions?
References
