

Homework 1 Active Learning

Active Learning by Feature Mixing

- What problem does this paper try to solve, i.e., its motivation

This paper aims to improve active learning for high dimensional data like images and videos.

- How does it solve the problem?

This paper introduces ALFA-Mix, a method that leverages both labeled and unlabeled data in the latent space to extract features for unlabeled data.

- list of novelties/contributions
 1. Propose a new method to identify unlabeled data with new features
 2. Outperform SOTA
- What do you think are the downsides of the work?

This latent space interpolation method only works when the underlying features can interpolate.

Active Learning for Domain Adaptation: An Energy-Based Approach

- What problem does this paper try to solve, i.e., its motivation

This paper aims to improve domain generalization in the context of active learning.

- How does it solve the problem?

This paper introduces energy-based active learning to select data with high domain-specific energy scores.

- list of novelties/contributions
 1. Propose a new energy-based sampling protocol for domain adaptation.
 2. Outperform those estimation by domain discrepancies or by sample uncertainty.
- What do you think are the downsides of the work?

I don't think why energy-based models work is well explained in this paper.

Learning Objective-Specific Active Learning Strategies with Attentive Neural Processes

- What problem does this paper try to solve, i.e., its motivation

This paper studies why traditional active learning methods cannot work well on non-standard objectives

- How does it solve the problem?

This paper proposes an attentive conditional neural process model to learn active learning strategies tailored to specific objectives.

- list of novelties/contributions
 1. Propose a new framework for active learning that generalize to non standard objectives.
 2. Outperform baseline methods when facing imbalanced data.
- What do you think are the downsides of the work?

Due to computation complexity, their method only works for simple model and simple dataset, which cannot be generalizable.