Learned Data Augmentation and Non-autoregressive Translation

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Abstract

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1 Introduction

Learned models of data are often misspecified. When the goal of modeling is not density estimation, but some alternative objective, this misspecification may lead to undesirable behaviour under the maximum likelihood objective. In this note, we consider learned data augmentation techniques to edit each data point so that the data as a whole is more amenable to learning for a particular model.

2 Problem Setup

Given data consisting of (x, y) pairs, our goal is to learn a model $q(y \mid x)$ such that it maximizes some objective $\mathbb{E}_{p(x,y)}\left[\text{argmax}_{\hat{y}} D(q(\hat{y} \mid x), y)\right]$, where D is some discrepancy measure between our prediction $\hat{y}$ and the true output y. A concrete example of this is translation, where x is a source sentence (for example, German), y is a target sentence (for example, English), and D is the BLEU score between our generated translation and the true reference target sentence. Our goal is to, given a family of student models $q_\theta(y \mid x)$ indexed by θ, learn an edit model $q_\phi(\hat{y} \mid y, x)$ whose conditional distribution over $\hat{y}$ is easier for the student model q_θ to learn.

3 Method

References