Linear bandits with Feature Feedback

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Abstract

1 Introduction

2 Learning with Feature Feedback

3 Theorem for tighter regret bound

4 Algorithms

4.1 Provable algorithm that works with side information

4.2 A continuous version of the provable algorithms that works well in practice

5 Experiments

5.1 Simulations on synthetic data

5.2 Simulations on documents categorization data

The usual ML approach involves providing a machine with labeled data (collected passively or actively). Each training example consists of a vector of features $\boldsymbol{x} \in \mathbb{R}^d$ and a class label y. The feature vectors can be easily machine-generated (e.g., by extracting visual features from images or language features from documents). The label y is the key (and usually the only) piece of information provided by a human expert. But a person may be able to provide richer forms of annotation [?, ?]. In addition to providing a label, a person may also be able to provide an *explanation* for the label. For example, the person could point out the specific features that were most important in deciding on the correct label. This kind of feedback is not always trivial to obtain or model. In the context of image classification, the person could convey this information by indicating a region-of-interest in the image.