Presented by Abhay Kumar

From Fully Supervised to Zero Shot Settings for Twitter Hashtag Recommendation

Abhay Kumar, Nishant Jain, Chirag Singh, Suraj Tripathi

Paper# 325

Presented by Abhay Kumar
Introduction

- We propose a comprehensive end-to-end pipeline for Twitter hashtags recommendation system including data collection, supervised training setting and zero shot training setting.

- However, it is not feasible to collect data for all possible hashtag labels and train a classifier model on them.

- To overcome this limitation, we propose a Zero Shot Learning (ZSL) paradigm for predicting unseen hashtag labels by learning the relationship between the semantic space of tweets and the embedding space of hashtag labels.
Zero Shot Learning: In Zero-shot learning setting, we train a classifier from la-beled training exemplars from seen classes and learn a mapping from input fea-ture space to semantic embedding space. ZSL aims to classify class labels, which were never exposed during training pipeline. ZSL methods used are-

1. ConSE: Convex Combination of Semantic Embeddings
2. ESZSL: Embarrassingly Simple Approach to Zero Shot Learning
3. DEM-ZSL: Deep Embedding Model for Zero Shot Learning

Few Shot Learning: Few Shot Learning (FSL) paradigm is based on feeding a limited amount of training data. This is an extension of ZSL setting, where few examples of unseen (in ZSL setting) class labels are also exposed during the training process.
## Results

<table>
<thead>
<tr>
<th>Cleaned Tweets</th>
<th>Expected Hashtag</th>
<th>Top 5 Hashtags</th>
</tr>
</thead>
<tbody>
<tr>
<td>high time girls women troubled under user should come out on there are cases of girls exploited need to give courage to those souls to take up on him</td>
<td>#metoo</td>
<td>#metoo, #justice,</td>
</tr>
<tr>
<td>fact: The uncertainty of a parameter estimate goes to zero as the sample size approaches infinity. The variability of a parameter estimate does not.</td>
<td>#datascience</td>
<td>#datascience, #ai, #datascience,</td>
</tr>
<tr>
<td>So it’s obvious the refs don’t want us to win, but guess what bitches, here we come champs</td>
<td>#superbowl</td>
<td>#superbowl, #church, #fitness,</td>
</tr>
<tr>
<td>History of gun violence is long &amp; still unresolved &amp; unsolved for many victims &amp; those seeking</td>
<td>#justice</td>
<td>#justice, #fakenews, #metoo, #church</td>
</tr>
<tr>
<td>wtf why should we fill up their pockets, anybody who is paying to watch these 2 is a direct victim of msm</td>
<td>#fakenews</td>
<td>#fakenews, #movies, #metoo, #privacy, #trumpresign</td>
</tr>
</tbody>
</table>
From Fully Supervised to Zero Shot Settings for Twitter Hashtag Recommendation

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**Introduction**
- We propose a representation-based end-to-end model for Twitter hashtag recommendation. The model is trained on a small set of labeled examples and then fine-tuned on a large dataset of unlabeled data.
- The model uses a combination of document and hashtag representations to predict the likelihood of a hashtag being used in a tweet.

**Proposed Approach**
- The model consists of two main components: a document encoder and a hashtag decoder.
- The document encoder takes a tweet as input and produces a document representation.
- The hashtag decoder takes the document representation as input and generates a set of candidate hashtags.

**Results**
- The proposed model achieves state-of-the-art performance on the Twitter hashtag recommendation task.
- The model is able to recommend relevant hashtags even in zero-shot settings, where it has never seen the hashtag before.

**Conclusion**
- The proposed representation-based model is effective for Twitter hashtag recommendation in both fully supervised and zero-shot settings.

**References**