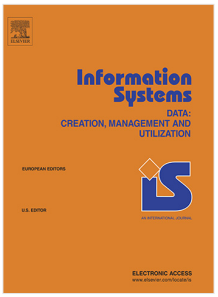
Accepted Manuscript



End-to-end neural opinion extraction with a transition-based model

Meishan Zhang, Qiansheng Wang, Guohong Fu

PII: S0306-4379(18)30118-2
DOI: https://doi.org/10.1016/j.is.2018.09.006
Reference: IS 1339

To appear in: *Information Systems*

Received date : 6 March 2018
Revised date : 20 September 2018
Accepted date : 27 September 2018

Please cite this article as: M. Zhang, et al., End-to-end neural opinion extraction with a transition-based model, *Information Systems* (2018), https://doi.org/10.1016/j.is.2018.09.006

End-to-End Neural Opinion Extraction with A Transition-Based Model

Meishan Zhang[a], Qiansheng Wang[a], Guohong Fu[a,*]

[a]School of Computer Science and Technology, Heilongjiang University, Harbin, China

Abstract

Fine-grained opinion extraction has received increasing interests in the natural language processing community. It usually involves several subtasks. Recently, joint methods and neural models have been investigated by several studies, achieving promising performance by using graph-based models such as conditional random field. In this work, we propose a novel end-to-end neural model alternatively for joint opinion extraction, by using a transition-based framework. First, we exploit multi-layer bi-directional long short term memory (LSTM) networks to encode the input sentences, and then decode incrementally based on partial output results dominated by a transition system. We use global normalization and beam search for training and decoding. Experiments on a standard benchmark show that the proposed end-to-end model can achieve competitive results compared with the state-of-the-art neural models of opinion extraction.

Keywords: Opinion Extraction, End-to-End, Transition-Based System

1. Introduction

Opinion Extraction, which identifies opinion expressions along with their opinion arguments such as holders and targets in text, has drawn much attention recently [1, 2, 3]. The task can be modeled in different ways. We can perform corpus-level analysis, extracting high-confidence opinions for a given corpus [4, 5]. Besides, we can perform sentence-level analysis [6, 7, 8, 9] as well, extracting opinion entities and relations for each sentence. Here we concentrate on the latter sentence-level opinion analysis.

Figure 1 shows two examples of the task, where the first case contains only one opinion and the second case includes two opinions. As shown, we are interested in three types of opinion entities, namely opinion expressions (EXP), holders (HLD) and targets (TGT), and two kinds of opinion relations over the

*Corresponding author

Email addresses: mason.zms@gmail.com (Meishan Zhang), chncwang@gmail.com (Qiansheng Wang), ghfu@hlju.edu.cn (Guohong Fu)