

# A Bilingual Attention Network for Code-switched Emotion Prediction

Zhongqing Wang<sup>1</sup>, Yue Zhang<sup>1</sup>, Sophia Yat Mei Lee<sup>2</sup>, Shoushan Li<sup>3</sup>, and Guodong Zhou<sup>3</sup>

<sup>1</sup> Singapore University of Technology and Design, Singapore

<sup>2</sup> The Hong Kong Polytechnic University, Hong Kong, China

<sup>3</sup> Soochow University, Suzhou, China

wangzq.antony@gmail.com, yue\_zhang@sutd.edu.sg, ym.lee@polyu.edu.hk, {lishoushan, gdzhou}@suda.edu.cn

## Introduction

Emotions in code-switching texts can be expressed in either monolingual or bilingual forms.

### Challenge:

- Explore both monolingual and bilingual information of each post
- Capture the informative words from the code-switching context

### Bilingual Attention Network (BAN) model

- aggregate the monolingual and bilingual informative words to form attention vectors
- integrate the attention vectors to predict the emotion

## Examples Code-switching posts

[E1] 开学以来，浮躁的情绪。不安稳的心态。确实该自己检讨一下了，**Sigh**

(I have been grumpy and emotional since the first day of school, unstable mindset too. It's really time to self-evaluate, **sigh**)

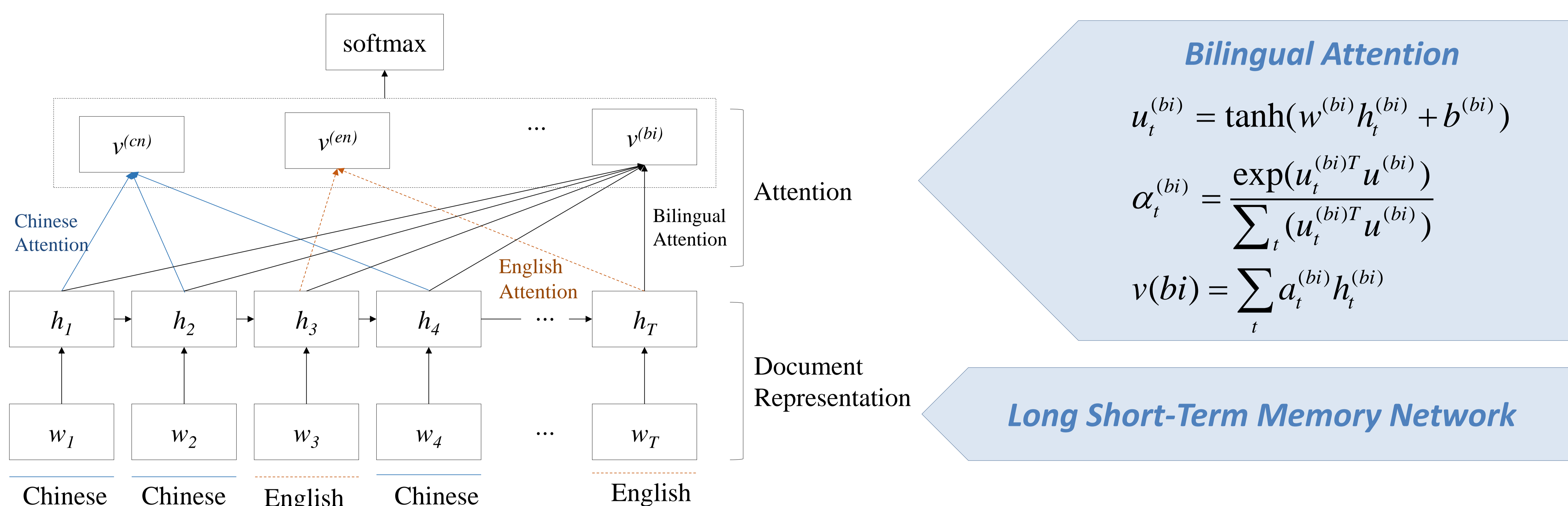
Only a few word express emotion

[E2] 早起直接飙酒，喝多上车回校，回校一睁眼过站，多么**happy**的一天。

(I drank too much in the morning. I got drunk and went back to school by bus, and I missed my stop. Such a **happy** day.

Sentimental word express opposite emotion

## Bilingual Attention Network



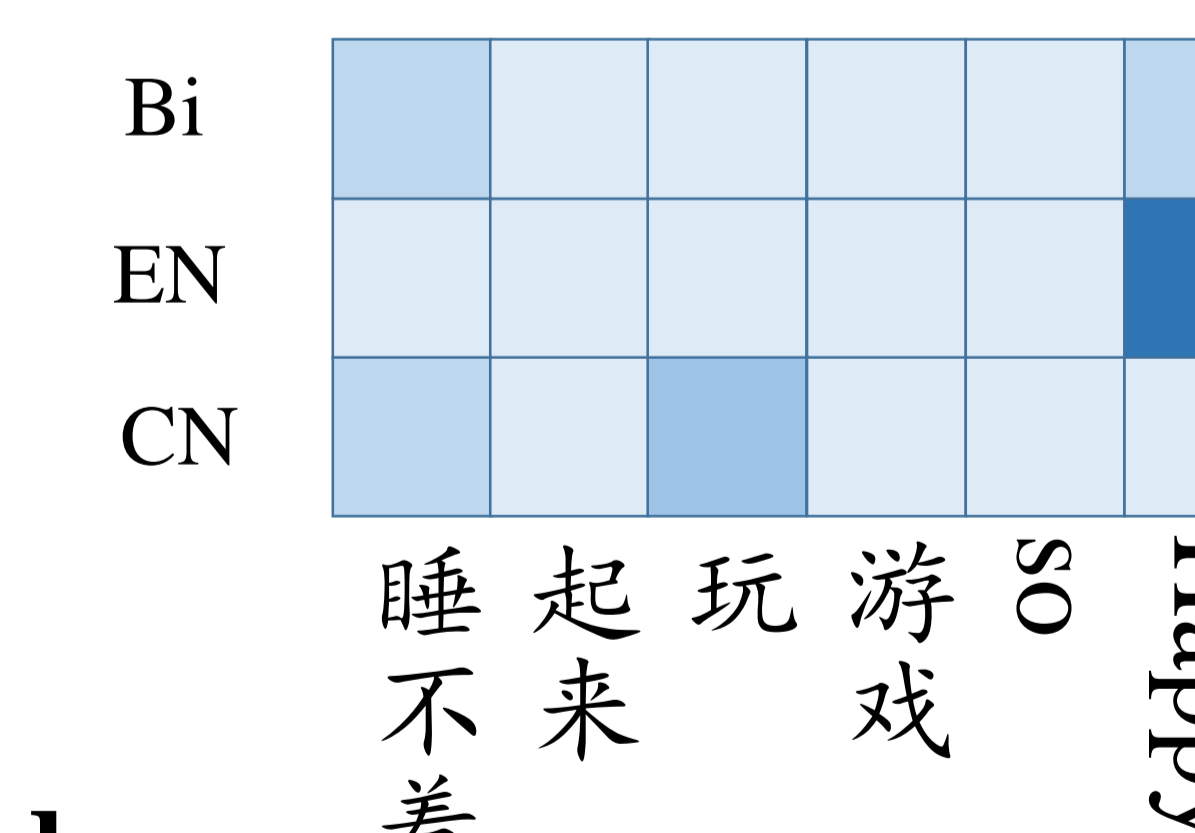
## Experiments

	TC	SVM	BLP-BS	LSTM	BAN
Happiness	0.258	0.591	0.638	0.662	0.678
Sadness	0.207	0.573	0.628	0.614	0.634
Anger	0.194	0.677	0.700	0.659	0.728
Fear	0.187	0.719	0.693	0.700	0.728
Surprise	0.211	0.548	0.560	0.575	0.594
Average	0.211	0.622	0.645	0.642	0.672

- Term-Counting (TC)** counts the Chinese and English emotional cue words for each post
- SVM** is the basic model which uses all the Chinese and English text of each post as features
- BLP-BS** is proposed by Wang et al., (2015), uses a Bipartite graph based Label Propagation framework

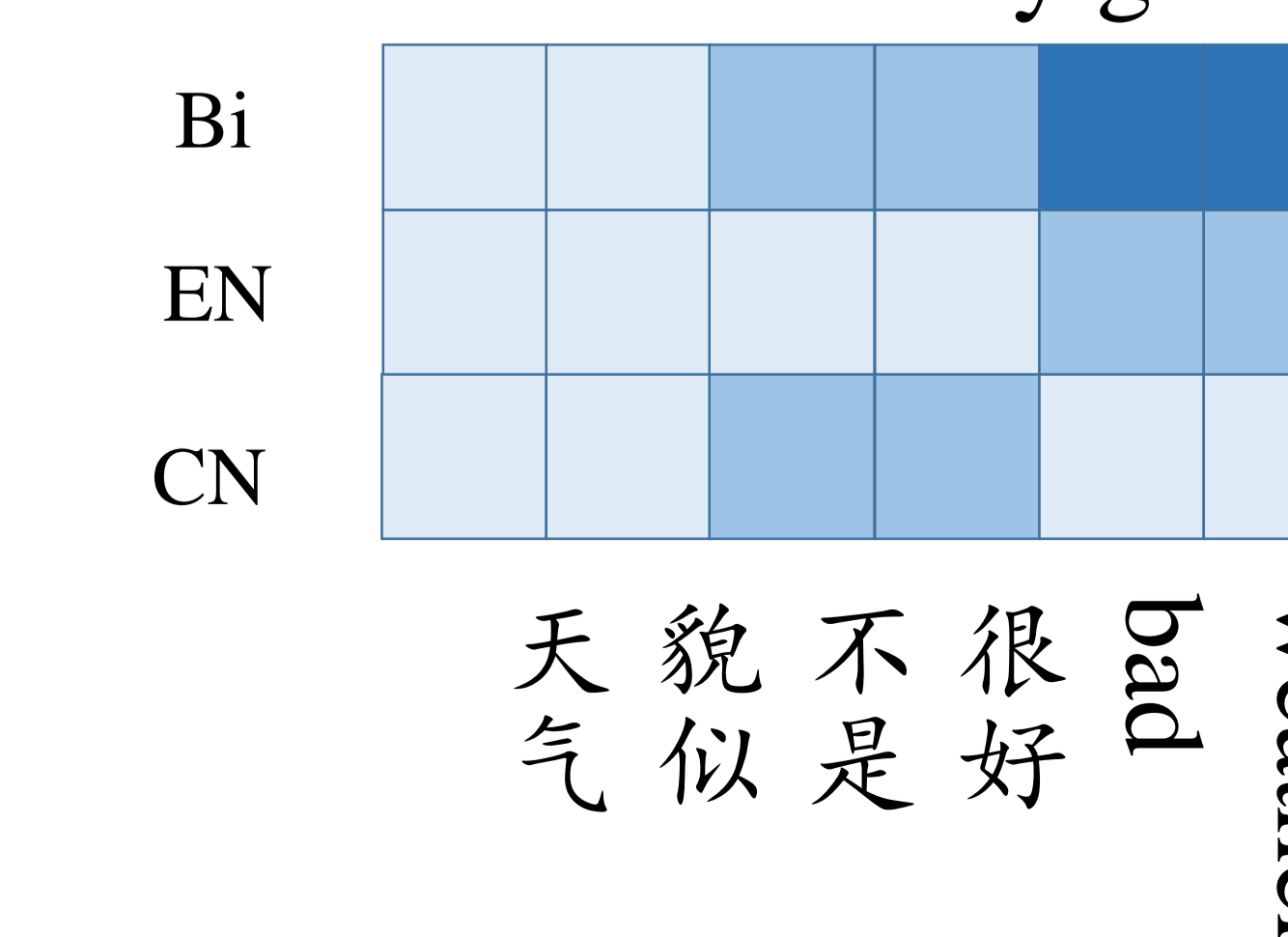
### Emotion: Happiness

睡不着，起来打游戏。so happy!  
(I couldn't sleep, so I woke up and played game. So happy!)



### Emotion: Sadness

天氣貌似不是很好。bad weather!  
(It seems that the weather is not very good, bad weather!)



Example of attention results