



Predicting Prosodic Prominence from Text

郭成凯

Prosodic prominence

- the amount of emphasis that a speaker gives to a word

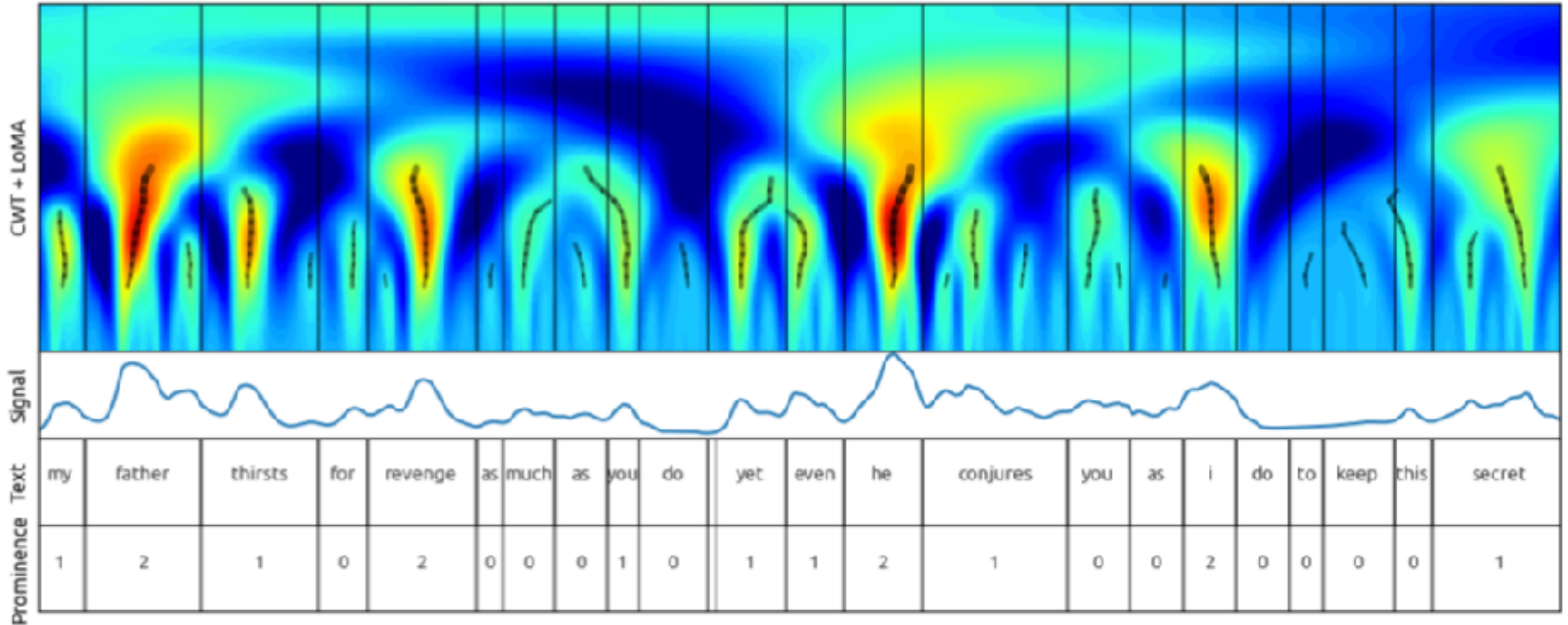
ex.

One way led to the left and the other to the right straight up the mountain .

Dataset

- From LibriTTS
- CWT annotation Tools
- Largest publicly available dataset

Continuous Wavelet Transform Annotation method



Dataset statistics

				non-prominent	prominent	
sets (clean)	speakers	sentences	words	0	1	2
train-100	247	33,041	570,592	274,184	155,849	140,559
train-360	904	116,262	2,076,289	1,003,454	569,769	503,066
dev	40	5,726	99,200	47,535	27,454	24,211
test	39	4,821	90,063	43,234	24,543	22,286
total:	1230	159,850	2,836,144	1,368,407	777,615	690,122

Experiments

Model	Test accuracy (2-way)	Test accuracy (3-way)
BERT-base	83.2%	68.6%
3-layer BiLSTM	82.1%	66.4%
CRF	81.8%	66.4%
SVM+GloVe	80.8%	65.4%
Majority class per word	80.2%	62.4%
Majority class	52.0%	48.0%
Random	49.0%	39.5%

Bert Based Training

```
# Train BERT-Uncased
python3 main.py \
    --model BertUncased \
    --train_set train_360 \
    --batch_size 32 \
    --epochs 2 \
    --save_path results_bert.txt \
    --log_every 50 \
    --learning_rate 0.00005 \
    --weight_decay 0 \
    --gpu 0 \
    --fraction_of_train_data 1 \
    --optimizer adam \
    --seed 1234
```

Output

```
<word> tab <label> tab <prediction>
```

Example output:

And	0	0
those	2	2
who	0	0
meet	1	2
in	0	0
the	0	0
great	1	1
hall	1	1
with	0	0
the	0	0
white	2	1
Atlas	2	2
?	NA	NA

Bert Training issue

- >2 epoch accuracy goes down

Possible reasons

REF: **One** way led to the **left** and the other to the right **straight** up the mountain .

BERT: **One** way led to the **left** and the **other** to the right **straight** up the mountain .

REF: In the **next** moment he was **concealed** by the leaves .

BERT: In the **next** moment he was **concealed** by the leaves .

REF: I **had** to read it over **carefully** , as the **text** must be absolutely correct .

BERT: I **had** to read it over **carefully** , as the **text** must be absolutely **correct** .

REF: **Where** were you when you **began** to **feel** bad ?

BERT: Where **were** you when you began to feel **bad** ?

REF: He is taller than the Indian , **not** so tall as **Gilchrist** .

BERT: He is **taller** than the Indian , **not** so tall as **Gilchrist** .

repo

- repo:
<https://github.com/Helsinki-NLP/prosody>
- Paper:
<https://arxiv.org/pdf/1908.02262.pdf>

A long pier extends from the right side of the frame into the ocean towards the horizon. The sky is filled with soft, purple and pink clouds, suggesting a sunset or sunrise. The water is calm, reflecting the colors of the sky. A white callout box with a blue border is positioned in the lower half of the image, containing the word 'Thanks!' and a paragraph of placeholder text.

Thanks!

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.