Relational Graph Attention Network for Aspect-based Sentiment Analysis

Kai Wang, Weizhou Shen, Yunyi Yang, Xiaojun Quan , Rui Wang

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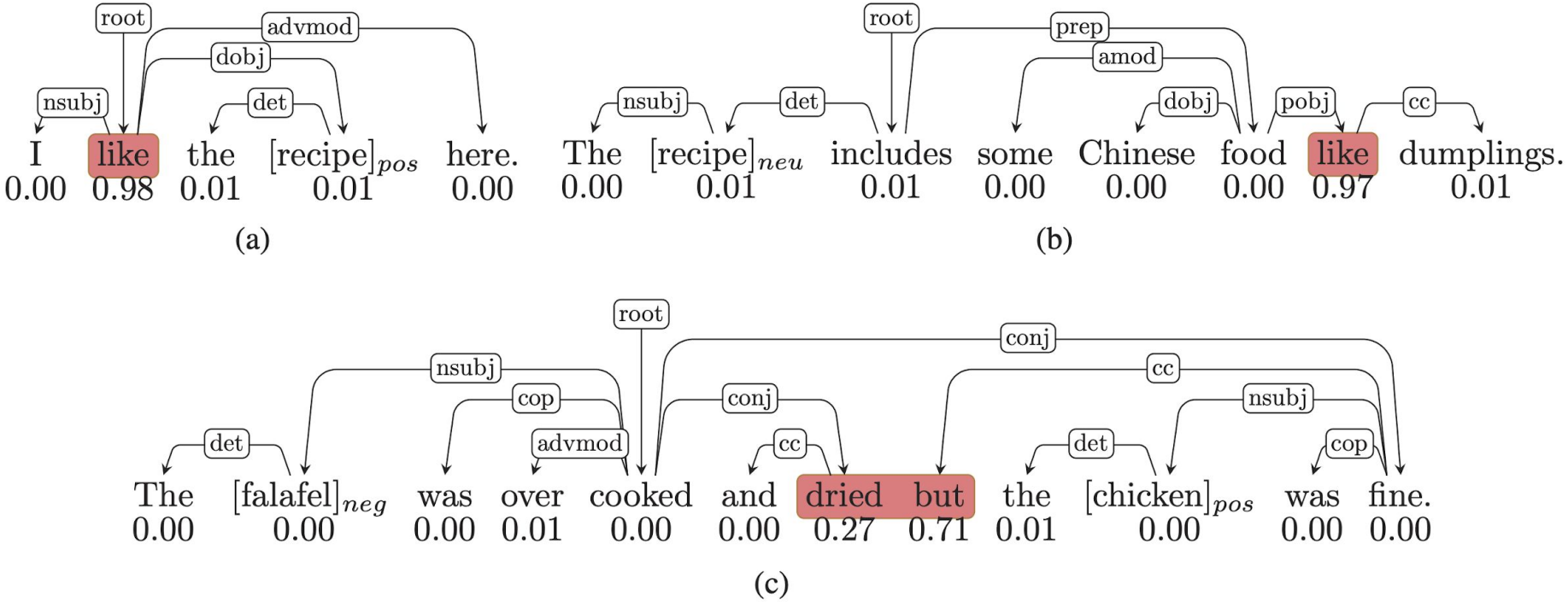
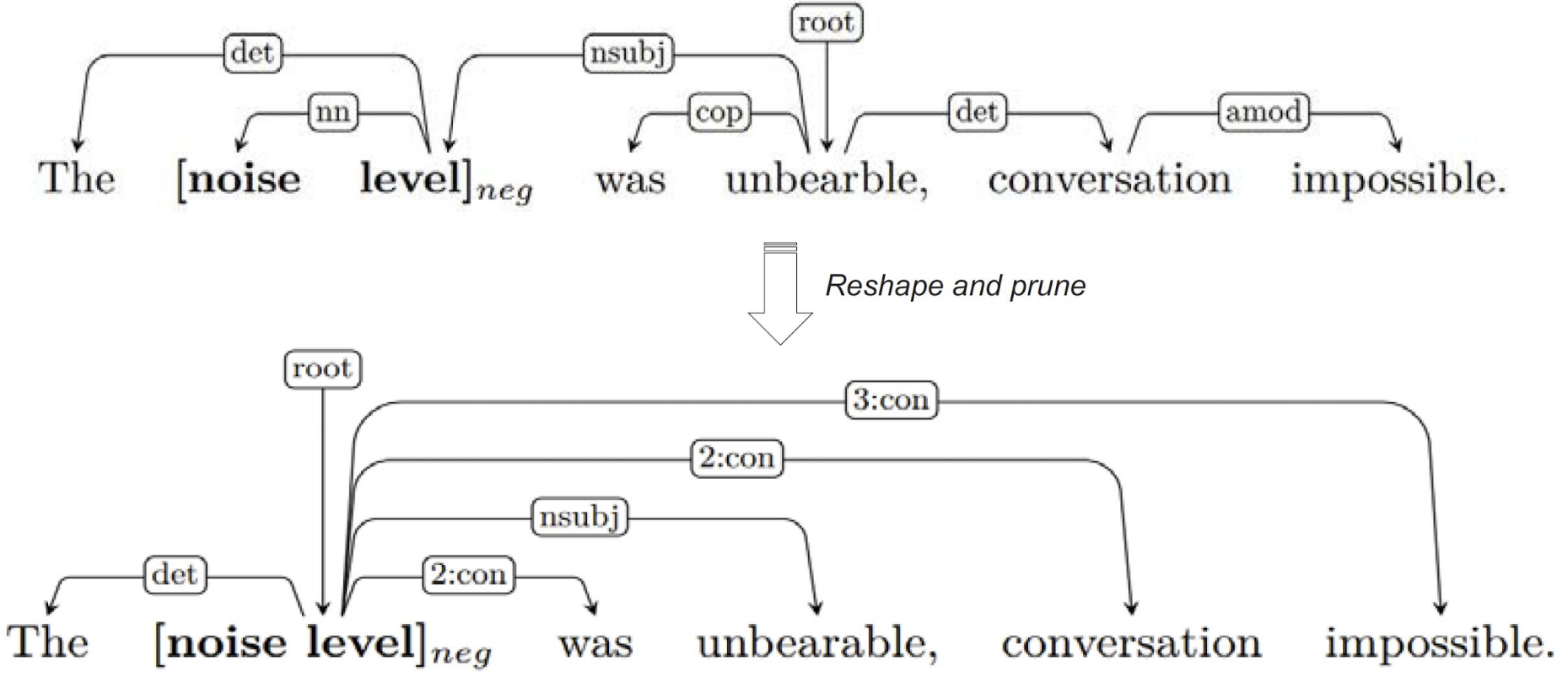
Problem with attention



Aspect-based dependency



Relation Graph Attention

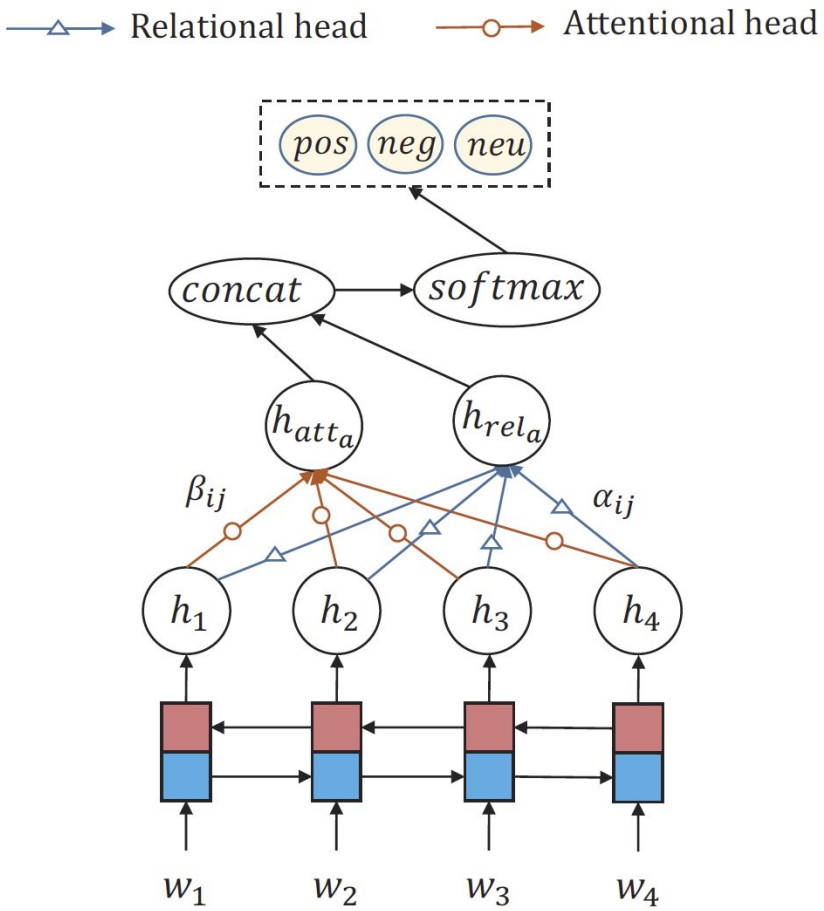
$$h_{rel_i}^{l+1} = ||_{m=1}^{M} \sum_{j \in \mathcal{N}_i} \beta_{ij}^{lm} W_m^l h_j^l \quad (3)$$

$$g_{ij}^{lm} = \sigma(relu(r_{ij} W_{m1} + b_{m1}) W_{m2} + b_{m2}) \quad (4)$$

$$\beta_{ij}^{lm} = \frac{exp(g_{ij}^{lm})}{\sum_{j=1}^{\mathcal{N}_i} exp(g_{ij}^{lm})} \quad (5)$$

$$x_i^{l+1} = h_{att_i}^{l+1} \,||\, h_{rel_i}^{l+1} \quad (6)$$

$$h_i^{l+1} = relu(W_{l+1} x_i^{l+1} + b_{l+1}) \quad (7)$$



Category	Method	Restaurant		Laptop		Twitter	
		Accuracy	Macro-F1	Accuracy	Macro-F1	Accuracy	Macro-F1
Syn.	LSTM+SynATT	80.45	71.26	72.57	69.13	-	-
	AdaRNN	-	-	-	-	66.30	65.90
	PhraseRNN	66.20	59.32	-	-	-	-
	ASGCN	80.77	72.02	75.55	71.05	72.15	70.40
	CDT	82.30	74.02	77.19	72.99	74.66	73.66
	GAT	78.21	67.17	73.04	68.11	71.67	70.13
	TD-GAT	80.35	76.13	74.13	72.01	72.68	71.15
Att.	ATAE-LSTM	77.20	-	68.70	-	-	-
	IAN	78.60	-	72.10	-	-	-
	RAM	80.23	70.80	74.49	71.35	69.36	67.30
	MGAN	81.25	71.94	75.39	72.47	72.54	70.81
	LSTM	79.10	69.00	71.22	65.75	69.51	67.98
	BERT	85.62	78.28	77.58	72.38	75.28	74.11
Others	GCAE	77.28	-	69.14	-	-	-
	JCI	-	68.84	-	67.23	-	-
	TNET	80.69	71.27	76.54	71.75	74.90	73.60
Ours	R-GAT	83.30	76.08	77.42	73.76	75.57	73.82
Ours	R-GAT+BERT	**86.60**	**81.35**	**78.21**	**74.07**	**76.15**	**74.88**

Span-ConveRT: Few-shot Span Extraction for Dialog with Pretrained Conversational Representations

Sam Coope, Tyler Farghly, Daniela Gerz, Ivan Vulic, Matthew Henderson

ACL 2020

REQUESTED SLOTS: []

“Can I book a table for me and my husband tonight? Anything free at half nine?”

PEOPLE DATE TIME

REQUESTED SLOTS: []

“Is there a table free in an hour?”

TIME,DATE

REQUESTED SLOTS: [FIRST_NAME, LAST_NAME]

“It’s Daniela Levin”

FIRST_NAME LAST_NAME

REQUESTED SLOTS: [PEOPLE]

“7”

PEOPLE

REQUESTED SLOTS: [TIME]

“7”

TIME

	people	time	date	first_name	last_name	total
train	**2164** (547)	**2164** (547)	**1721** (601)	**887** (364)	**891** (353)	8198
dev	**983** (244)	**853** (276)	**802** (300)	**413** (177)	**426** (174)	3731

https://raw.githubusercontent.com/PolyAI-LDN/task-specific-datasets/master/span_extraction/restaurant8k/train_0.json

Sample


```
{
    "userInput": {
        "text": "There will be 5 adults and 1 child."
    },
    "context": {
        "requestedSlots": [
            "people"
        ]
    },
    "labels": [
        {
            "slot": "people",
            "valueSpan": {
                "startIndex": 14,
                "endIndex": 34
            }
        }
    ]
},
{
    "userInput": {
        "text": "We will require and outside table to seat 9 people on August 23rd"
    },
    "labels": [
        {
            "slot": "people",
            "valueSpan": {
                "startIndex": 42,
                "endIndex": 50
            }
        },
        {
            "slot": "date",
            "valueSpan": {
                "startIndex": 54,
                "endIndex": 65
            }
        }
    ]
},
```