Enriching Pre-trained Language Model with Entity Information for Relation Classification

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Introduction

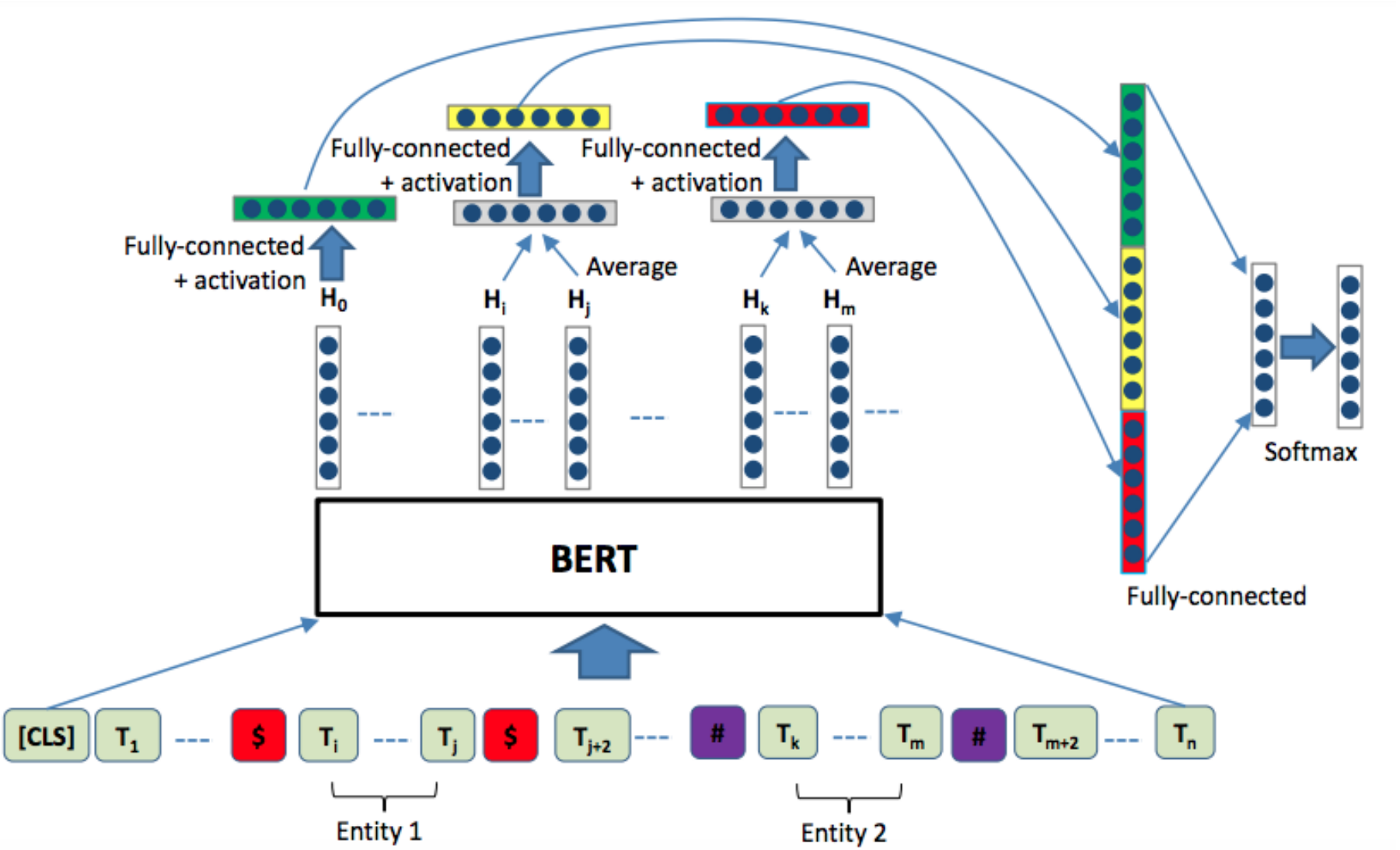
- Semantic Relation classification is an important NLP task to extract relations between entities in a sentence
- SemEval-2010 Task 8 presents a dataset with 10,717 data instances
- Semantic relations includes - Cause-Effect (CE), Instrument-Agency (IA), Product-Producer (PP), Content-Container (CC), Entity-Origin (EO), Entity-Destination (ED), Component-Whole (CW), Member-Collection (MC), Communication-Topic (CT), Other

Data Instances Examples

- Member-Collection (e1, e2): there are many [e1]trees[e1] in the [e2]forest[e2]
- Communication-Topic (e1, e2): the [e1]lecture[e1] was about [e2]semantics[e2]
- Component-Whole (e2, e1): my [e1]apartment[e1] has a large [e2]kitchen[e2]

Methodology

Pre-trained BERT with encoding of the two entities



Results

Notebook - https://tinyurl.com/32pw8vw3

	precision	recall	f1-score	support
Message-Topic(e1,e2)	0.93	0.94	0.93	134
Product-Producer(e2,e1)	0.92	0.91	0.92	194
Instrument-Agency(e2,e1)	0.88	0.90	0.89	162
Entity-Destination(e1,e2)	0.82	0.84	0.83	150
Cause-Effect(e2,e1)	0.88	0.90	0.89	153
Component-Whole(e1,e2)	0.87	0.85	0.86	39
Product-Producer(e1,e2)	0.93	0.95	0.94	291
Member-Collection(e2,e1)	0.00	0.00	0.00	1
Other	0.91	0.89	0.90	211
Entity-Origin(e1,e2)	0.93	0.89	0.91	47
Content-Container(e1,e2)	0.76	0.73	0.74	22
Entity-Origin(e2,e1)	0.88	0.77	0.82	134
Cause-Effect(e1,e2)	0.81	0.81	0.81	32
Component-Whole(e2,e1)	0.87	0.91	0.89	201
Content-Container(e2,e1)	0.89	0.95	0.92	210
Instrument-Agency(e1,e2)	0.86	0.94	0.90	51
Message-Topic(e2,e1)	0.67	0.65	0.66	454
Member-Collection(e1,e2)	0.85	0.86	0.86	108
Entity-Destination(e2,e1)	0.89	0.93	0.91	123
accuracy			0.85	2717
macro avg	0.82	0.82	0.82	2717
weighted avg	0.85	0.85	0.85	2717

References

- Shanchan W., Yifan H., Enriching Pre-trained Language Model with Entity Information for Relation Classification, arXiv:1905.08284, 2019
- Iris H., Su N.K., Zornitsa K., Preslav N., Diarmuid O.S.E., Sebastian P.K., Marco P., Lorenza R., Stan S., SemEval-2010 Task 8: Multi-Way Classification of Semantic Relations Between Pairs of Nominals, arXiv:1911.10422, 2010