A Multi-Projection Recurrent Model for Hypernym Detection and Discovery

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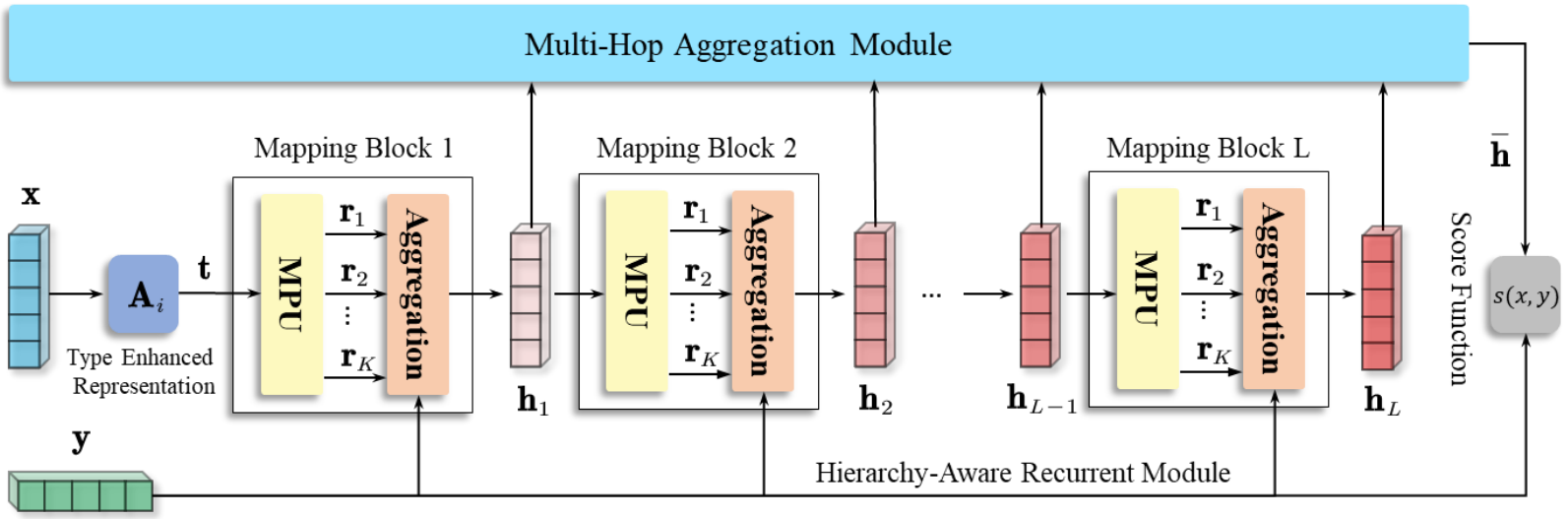
Problems & Ideas

- Problems of hypernym detection and discovery approaches:
  - The polysemy phenomenon that hypernyms may express distinct senses is understudied.
  - Existing methods fall short in modeling the hierarchical structure in the hypernymy relations.
- Ideas: A multi-projection recurrent model that captures the polysemy with multiple mapping blocks and models the hierarchy with recurrent operations.



The framework of the proposed method.

Main Contributions

- Contributions:
  - A novel hypernym detection and discovery model that simultaneously captures the hierarchical relationships between terms and deals with diverse senses caused by the polysemy phenomenon;
  - A mapping block with multiple projections to obtain term representations covering various meanings and deal with the polysemy phenomenon;
  - A hierarchy-aware recurrent module to formulate the transformations from the hyponym to hypernyms at different semantic levels.

	1A			2A			2B		
Methods	MAP	MRR	P@5	MAP	MRR	P@5	MAP	MRR	P@5
MFH	8.77	21.39	7.81	28.93	35.80	34.20	33.32	51.48	35.76
vTE	10.60	23.83	9.91	18.84	41.07	20.71	12.99	39.36	12.41
300-sparsans	8.95	19.44	8.63	17.94	37.56	17.06	12.08	25.14	11.73
NLP-HZ	9.37	17.29	9.19	20.04	28.27	20.39	11.37	19.19	11.23
CRIM	19.78	36.10	19.03	34.05	54.64	36.77	40.97	60.93	41.31
SPON	20.20	36.95	19.40	33.50	50.60	35.10	54.70	71.20	56.30
MPR (ours)	**27.54**	**40.54**	**23.74**	**38.47**	**55.29**	**38.39**	**64.63**	**76.60**	**62.65**

The evaluation results in the hypernym discovery task. The best results are marked as bold.