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IMPROVING HYPERNYMY EXTRACTION
WITH DISTRIBUTIONAL SEMANTIC
CLASSES

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Introduction

Hypernyms

Examples of hypernymy relations

- **apple** –isa→ **fruit**
- **mangosteen** –isa→ **fruit**

Hypernyms

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Examples of hypernymy relations

- **apple** –isa→ **fruit**
- **mangosteen** –isa→ **fruit**

Examples of applications of hypernyms

- question answering [Zhou et al., 2013]
- query expansion [Gong et al., 2005]
- semantic role labelling [Shi & Mihalcea, 2005]

Automatic extraction of hypernyms
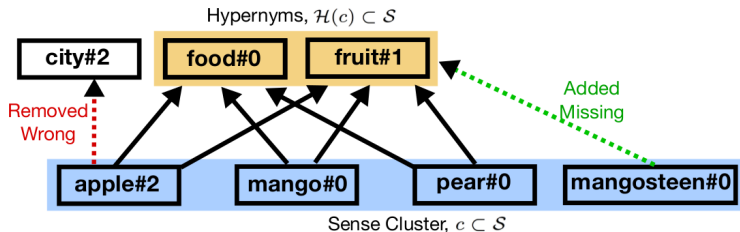
Main contributions

- We show how distributionally-induced **semantic classes** can be helpful for **extracting hypernyms**:

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- We show how distributionally-induced **semantic classes** can be helpful for **extracting hypernyms**:

    1. A method for inducing sense-aware semantic classes using distributional semantics;

    2. A method for using the induced semantic classes for filtering noisy hypernymy relations.

Method

post-processing of hypernymy relation
distributionally induced semantic class

Hypernyms, $\mathcal{H}(c) \subset \mathcal{S}$

city#2 food#0 fruit#1

Removed Wrong

Added Missing

apple#2 mango#0 pear#0 mangosteen#0

Sense Cluster, $c \subset \mathcal{S}$

- post-processing of hypernymy relations using distributionally induced semantic classes
- a semantic class is a clusters of induced word senses labeled with hypernyms

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Results

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📄 Gong, Z., Cheang, C. W., & Leong Hou, U. (2005).
Web Query Expansion by WordNet.
In *Proceedings of the 16th International Conference on Database and Expert Systems Applications - DEXA '05* (pp. 166–175). Copenhagen, Denmark: Springer Berlin Heidelberg.

📄 Shi, L. & Mihalcea, R. (2005).
Putting Pieces Together: Combining FrameNet, VerbNet and WordNet for Robust Semantic Parsing.
In *Proceedings of the 6th International Conference on Computational Linguistics and Intelligent Text Processing*, CICLing 2005 (pp. 100–111). Mexico City, Mexico: Springer Berlin Heidelberg.

📄 Zhou, G., Liu, Y., Liu, F., Zeng, D., & Zhao, J. (2013).
Improving question retrieval in community question answering using world knowledge.
In *Proceedings of the Twenty-Third International Joint Conference on Artificial Intelligence*, IJCAI '13 (pp. 2239–2245). Beijing, China: AAAI Press.