Exploiting Semantic Relations for Fine-grained Entity Typing

Hongliang Dai  
*Hong Kong University of Science and Technology*

Yangqiu Song  
*Hong Kong University of Science and Technology*

Xin Li  
*Tencent Technology (SZ) Co., Ltd.*
Fine-grained Entity Typing (FET)

• Recognize the fine-grained types of a mention in a sentence that matches the context.
• The span of the mention is given.

Trump’s trade wars and ethanol policy hurt farmers.
The Typical Neural Approach to FET

• Get a representation for the mention string (e.g., average of word vectors).

• Get another representation for the context (e.g., use LSTM).

• Concatenate them and feed to a classification layer.
Motivation

• Existing FET approaches may overlook some useful semantic relations.
Motivation

• Existing FET approaches may overlook some useful semantic relations.

Connaught is a biotechnology research and vaccine manufacturing concern.

**Gold:** /ORGANIZATION, /ORGANIZATION/CORPORATION

**System Predict:** /ORGANIZATION
Motivation

• Existing FET approaches may overlook some useful semantic relations.

Connaught is a biotechnology research and vaccine manufacturing concern.

**Gold:** /ORGANIZATION, /ORGANIZATION/CORPORATION

**System Predict:** /ORGANIZATION

Motivation

• Existing FET approaches may overlook some useful semantic relations.

Characters drink Salty Dogs, whistle “Johnny B. Goode” and watch Bugs Bunny reruns.

Gold: /SUBSTANCE, /SUBSTANCE/FOOD

System Predict: /WORK_OF_ART

Motivation

• Existing FET approaches may overlook some useful semantic relations.

Characters drink Salty Dogs, whistle “Johnny B. Goode” and watch Bugs Bunny reruns.

**Gold**: /SUBSTANCE, /SUBSTANCE/FOOD

**System Predict**: /WORK_OF_ART

*Semantic Role Labeling* annotates “Salty Dogs” as a *patient* of the verb “drink”.

Our Approach

Connaught is a biotechnology research and vaccine manufacturing concern. Hypernym Relations can be helpful.

Characters drink Salty Dogs, whistle “Johnny B. Goode” and watch Bugs Bunny reruns. Verb-argument Relations can be helpful.

• Thus, we exploit these two types of relations related to the mention to improve FET.
Framework of Our Approach

Base FET Model

Hypernym Relation Based FET

Verb-argument Relation Based FET

Gating Network

Final Prediction
Framework of Our Approach

Base FET Model

Hypernym Relation Based FET

Verb-argument Relation Based FET

Final Prediction

Gating Network
Framework of Our Approach

Base FET Model

Hypernym Relation Based FET

Verb-argument Relation Based FET

Gating Network

Final Prediction
Framework of Our Approach

Base FET Model  →  Hypernym Relation Based FET  →  Verb-argument Relation Based FET  →  Gating Network  →  Final Prediction
Framework of Our Approach

Base FET Model

Hypernym Relation Based FET

Verb-argument Relation Based FET

Gating Network

Final Prediction
Thanks!

• Read our paper for more details if you are interested.
• Code will be available at:

  https://github.com/HKUST-KnowComp/SRFET