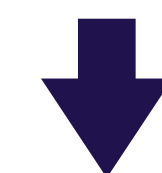# RESIDE: Improving Distantly-Supervised Neural Relation Extraction using Side Information

Shikhar Vashishth, Rishabh Joshi, Sai Suman, Chiranjib Bhattacharyya, Partha Talukdar

Indian Institute of Science, Bangalore

Relation Extraction

Relation Extraction is the task of identifying semantic relationship between two entity mentions from plain text. Since the labeled training data is expensive to construct, *Distant Supervision* is used for automatically aligning relational instances in a Knowledge Base with unstructured text. This allows to construct large training data but with noisy labels.

> Trump, US president addressed the people. Trump lives in White house, Washington DC. The first citizen of US, Donald Trump ...

<Trump> <President_of> <US>

Relation Extraction has been proved to be useful for several NLP tasks like questions answering, web search etc.

Contributions

1. We propose RESIDE, a novel neural model which utilizes additional supervision from KG for improving distant supervised RE.

2. RESIDE uses Graph Convolution Network for modeling syntactic information and performs competitive even with limited side information.

3. Through extensive experiments on multiple real-world datasets, we demonstrate RESIDE's effectiveness over state-of-the-art baselines.
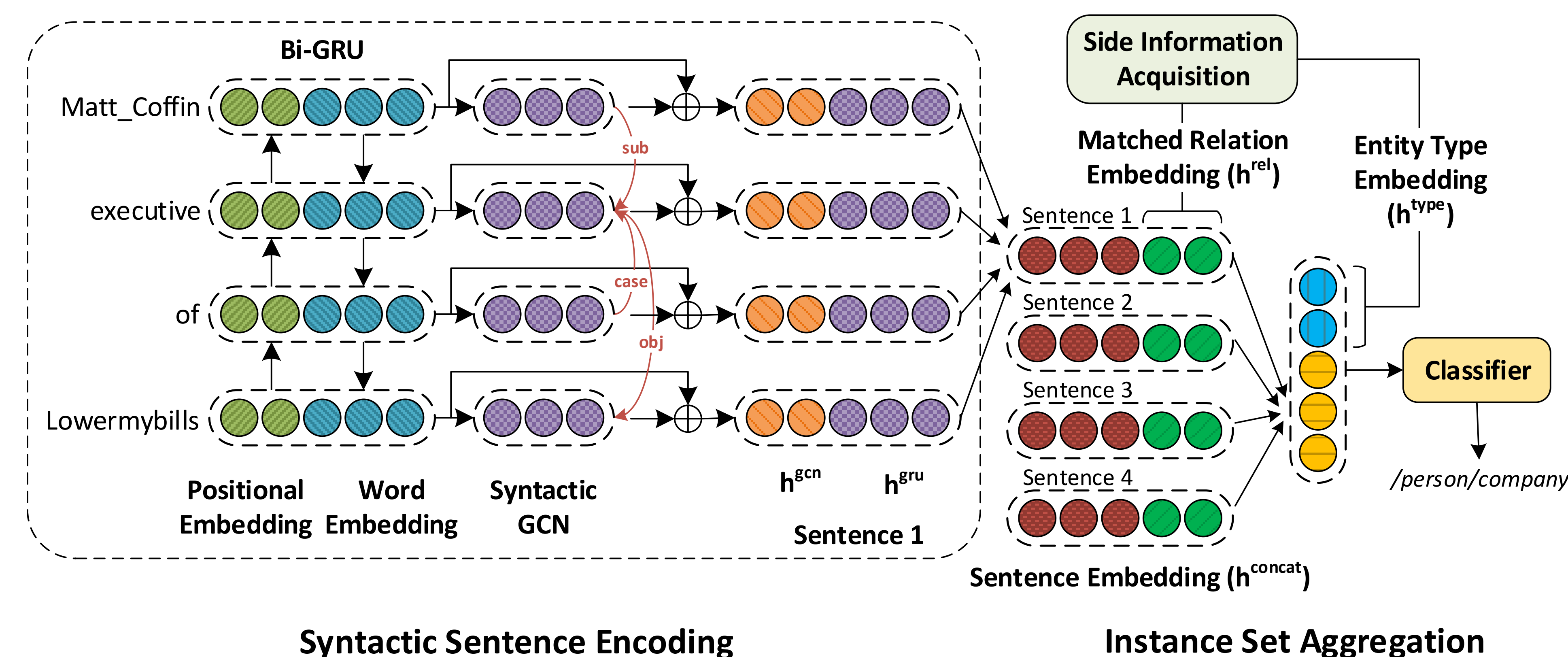
Source Code

RESIDE Overview

RESIDE's architecture consists of three components:

1. **Syntactic Sentence Encoding:** Uses Bi-GRU and GCN for encoding each sentence.
2. **Side Information Acquisition:** Utilizes additional supervision from KBs and Open IE methods for getting relevant side information.
3. **Instance Set Aggregation:** Attention over sentences to get a representation for the entire bag.

Side Information Acquisition
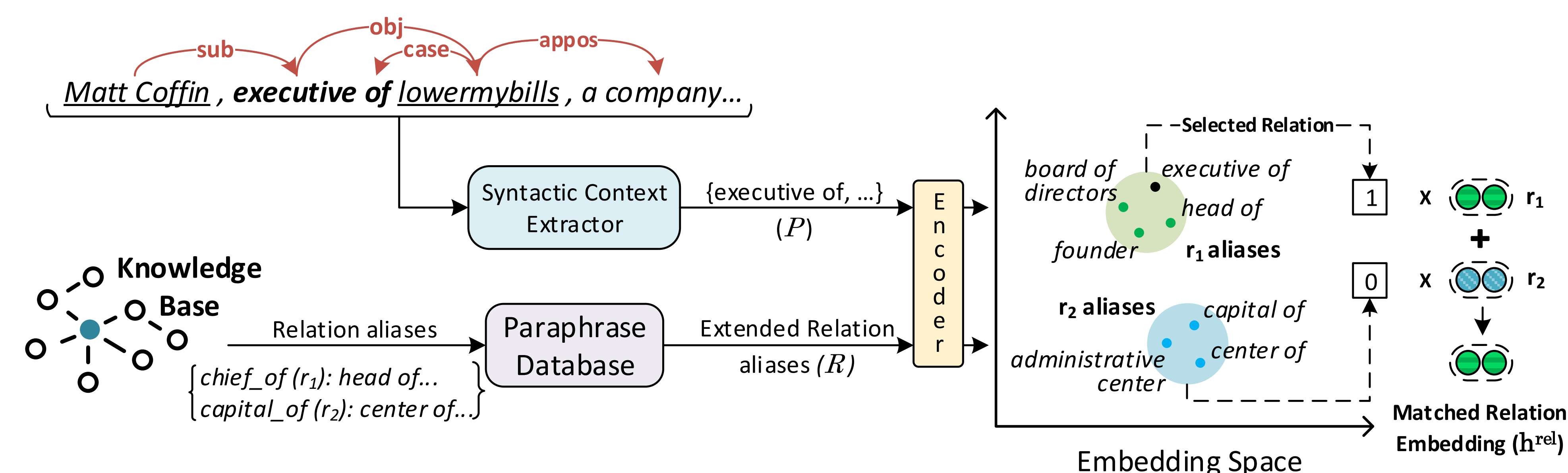
RESIDE utilizes the following two additional supervision from Knowledge Graph:

1. **Relation Alias side information:** : Extract relation phrases between target entities and links them to KG based on their closeness in embedding space.
2. **Entity type side information:** Utilizes entity type information from KG for putting constraints on predicted relation.

Results

Comparison of Precision-recall curve on Riedel and GIDS dataset.
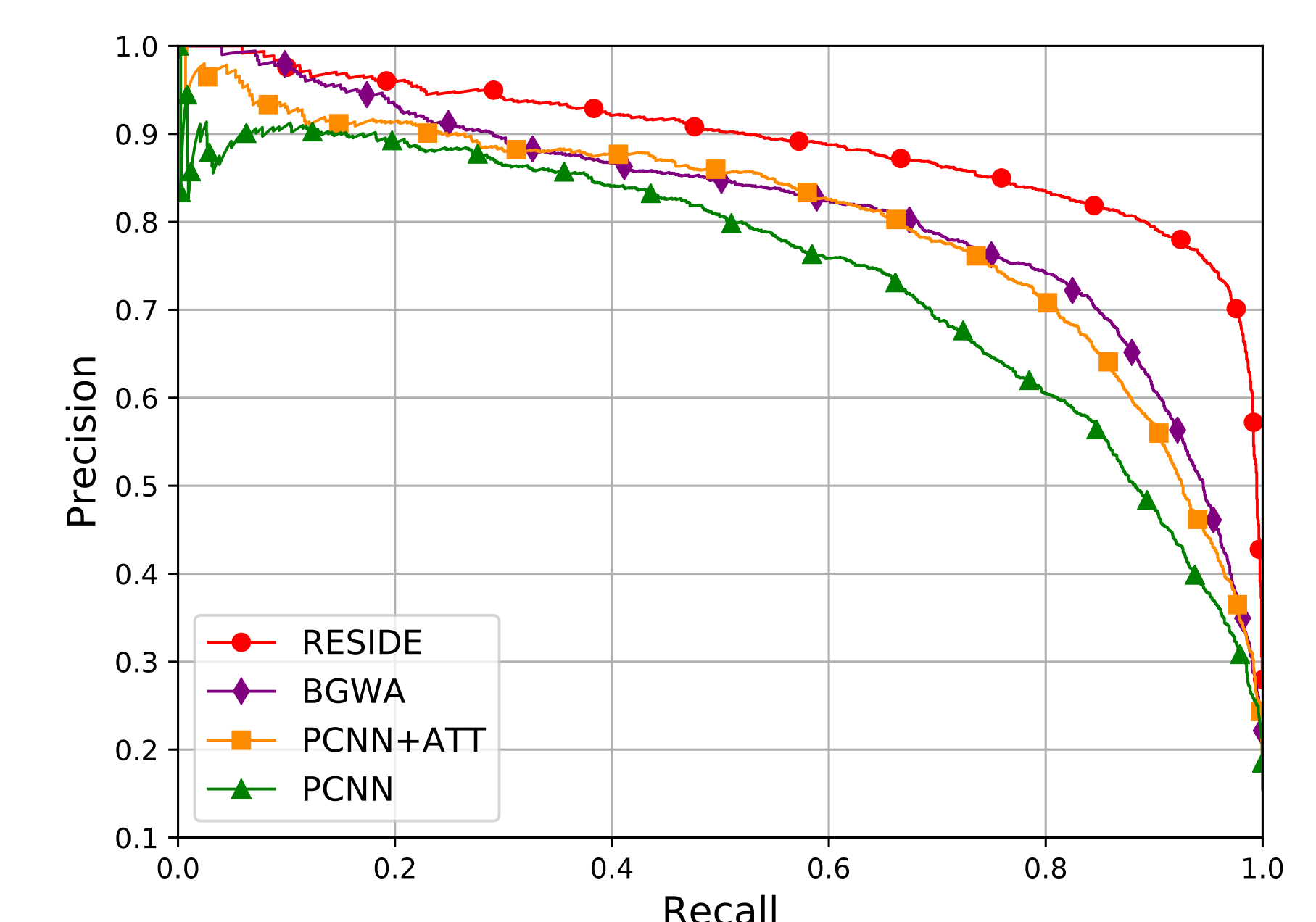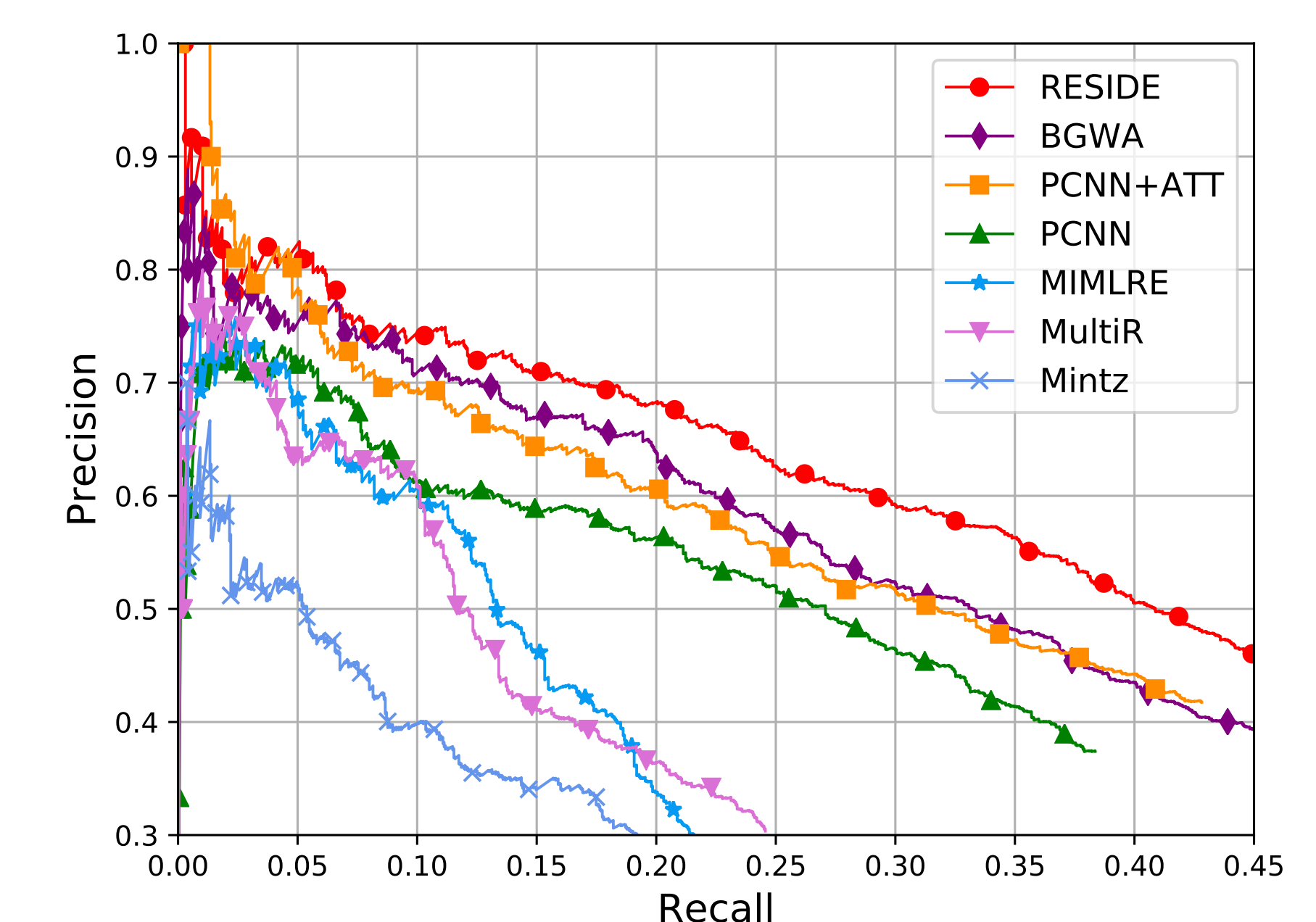
RESIDE achieves higher precision over the entire range of recall than all the baselines.

Ablation Results

Performance comparison of different ablated version of RESIDE on Riedel dataset.