

Potato, Potahto, Iliad, Ilias: Entity Alignment with Knowledge Graph Embeddings and Language Models

A Knowledge Graph (KG) contains real-world information organized to enable data sharing, understanding and reasoning. In order to make a KG consistent, integration with existing KGs is required. One such task, Entity Alignment¹ (EA), attempts to map equivalent entities from one KG (source) to another KG (target).

EA techniques are often hampered by entity name variations, multilingualism, and the heterogeneity of source-target KGs. Recent developments in Machine Learning and Natural Language Processing have been shown to mitigate these challenges.

In particular, KG Embeddings³ (KGEs) have proven invaluable through their ability to encode an entity's graph substructure, describing its neighborhood and the relations attached to it. These dense representations enable similarity-based scoring functions to compute equivalence between entities.

In addition, pre-trained Language Models⁴ (PLMs) encode the semantics found in the literals attached to entity names and attributes. They have been shown to address name variations and multilingualism.

The **goal** of this thesis is to explore and combine the aforementioned techniques in order to integrate the German Digital Library⁴ Knowledge Graph (DDB-KG) to existing and well-established KGs, such as, the Integrated Authority File (GND) and Wikidata.

This thesis will be supervised by **Mary Ann Tan**, **Dr. Russa Biswas**, and **Prof. Dr. Harald Sack**, **Information Service Engineering at Institute AIFB, KIT**, in collaboration with **FIZ Karlsruhe**.

[1] <https://doi.org/10.1016/j.aiopen.2021.02.002>

[2] <https://doi.org/10.1109/TKDE.2017.2754499>

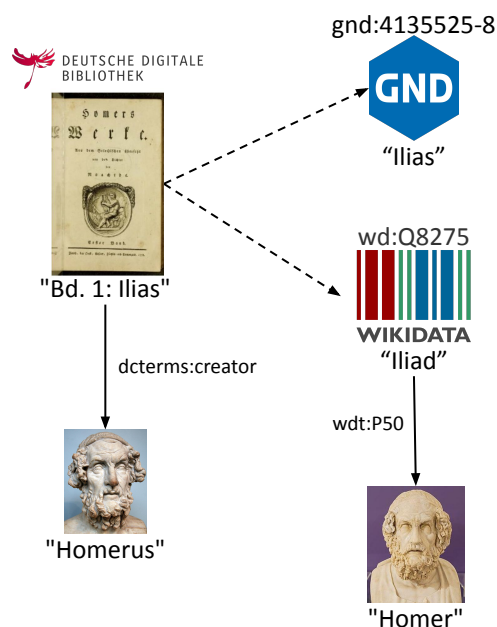
[3] <https://doi.org/10.1007/s11431-020-1647-3>

[4] <https://www.deutsche-digitale-bibliothek.de>

Prerequisites

- Good programming skills in Python
- Interest in Cultural Heritage
- Interest in Natural Language Processing
- Interest in Machine Learning approaches
- Interest in Semantic Web technologies

Entity Alignment



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