

Link Prediction by Leveraging Multilingual Entity Descriptions

Link Prediction in Knowledge Graphs (KGs) is a task of identifying missing links between entities. This task has been used in various KG embedding approaches to learn representations (embeddings) for different elements of KGs such as entities and relations in a low dimensional vector space. Most KGs like Dbpedia [1] contain textual descriptions of entities in various natural languages such as **English, German, Italian, Spanish, Arabic, Chinese, and etc.**

"The Diving Bell and the Butterfly is a 2007 biographical drama film based on Jean-Dominique Bauby's memoir of the same name.... It won awards at the Cannes Film Festival, the Golden Globes, the BAFTAs & the César Awards, and received four Academy Award nominations."@en

"The Golden Globe Award for Best Director has been presented to the annually by the Hollywood Foreign Press Association, an organization composed of journalists who cover the United States film industry for publications based outside North America, since 1943 ..."@en

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قناع الغوص والفراشة هو فيلم فرنسي أخرجه جوليان شنابل وكتبه رونالد هارود ورشح لجائزة الأوسكار للعام 2007 ... كما فاز شنابل بجائزة أفضل مخرج، وفاز الفيلم بجائزة أفضل فيلم ناطق بلغة اجنبية، ورشح رونالد هارود للحصول على جائزة أفضل سيناريو في الحفل الخامس والستين لجائزة الكرة الذهبية"@ar

"Golden Globe Award: Beste Regie\nGewinner und Nominierte in der Kategorie Beste Regie, die die herausragendsten Regieleistungen des vergangenen Kalenderjahres prämiert. Die Kategorie wurde im Jahr 1944 ins Leben gerufen.\nIn 37 von 72 Fällen wurde der beste Regisseur später mit dem Oscar ausgezeichnet, zuletzt 2014 geschehen ..."@de

These descriptions of entities provide valuable information that may not be explicitly represented in the structured part of the KG. Based on this fact, few attempts have been made to combine the structured part of KGs with textual descriptions of entities to learn KGE models such as DKRL [2]. However, these methods use entity descriptions in only one language and ignore the fact that descriptions given in different languages may provide complementary information and thereby also additional semantics.

Therefore, in this thesis, the problem of effectively leveraging multilingual entity descriptions for the purpose of link prediction in KGs will be investigated.

This thesis will be supervised by **Prof. Dr. Harald Sack and Genet Asefa Gesese, Information Service Engineering at Institute AIFB, KIT, in collaboration with FIZ Karlsruhe.**

[1] <https://wiki.dbpedia.org/>

[2] <https://www.aaai.org/ocs/index.php/AAAI/AAAI16/paper/view/12216/12004>



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Which prerequisites should you have?

- Good programming skills in Python
- Interest in Deep Learning technologies
- Interest in Machine Learning approaches
- Interest in Natural Language Processing

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