Geometric Embeddings for Logical Query on Knowledge Graphs

Answering logical queries on large-scale incomplete knowledge graphs is a challenging task. For instance, by answering the existential query, ‘Which drugs are likely to target proteins involved with both diseases X and Y, one can find potential cures for diseases. Recent approaches to this problem focus on embedding knowledge graph entities as well as the query into a vector space, such that entities answering the query are embedded close to the query.

However, vector space embedding of entities and queries is problematic since a broad set of entities could satisfy the existential query, making the selection of correct entities ambiguous. Another approach is to represent entities as geometric objects such as boxes, which are characterized by the centers and offsets of the boxes. This approach has been shown quite powerful for the existential logical queries. In this thesis, we would like to continue and extend the idea of geometric object embedding of entities and queries by investigating more advanced geometric objects with more freedom.

Requirements: Strong motivation, proficiency in Python & PyTorch, and a solid mathematical background.

Interested? Please contact us for more details!

Contact
- Zhao Meng: zhmeng@ethz.ch, ETZ G61.3
- Yuyi Wang: yuyiwang920@gmail.com, ETZ G63
- Yunpu Ma: cognitive.yunpu@gmail.com