Stream Embedding for Accrescent Knowledge Graphs

Abstract

Recently, embedding methods significantly progressed in efficient learning of Knowledge Graphs (KG). However, these approaches do not yet fully support the challenges of real-world KGs, such as embedding dynamic KGs. This study targets embedding a type of dynamic KGs that constantly grow by integrating a stream of new facts. We name such ever-growing graphs Accrescent knowledge Graphs (AKG). In contrast to discrete-time dynamic graphs (DTDG) that different snapshots of a KG are considered, the training of AKGs involves training upon the stream of new triples.

This study explains a use case of AKGs to support industrial data integration. We then discuss the challenges of several training strategies to avoid the iterative training of the whole KG. We propose a learning paradigm based on the studied challenges for this type of KG embedding. We finally set up experiments for the empirical evaluation of the proposed approach, where we demonstrate its efficiency in link prediction experiments on AKGs.

Keywords: Machine Learning, Knowledge Graphs Embedding, Link Prediction, Online Learning, Ever-Growing