

1 Case Study

We present a case study to illustrate the effectiveness of our proposed KERAG_R model in identifying useful relational information in order for the LLM to make accurate recommendations accordingly. To ensure a fair comparison, we conduct the comparison by randomly selecting users with medium range performances for both RecRanker and KERAG_R. We then selected one user (ID.5,924) from a total of 71,567 in the ML-10M dataset as a representative example to illustrate the comparative effectiveness of our model and the RecRanker baseline. Figure 1 shows the interacted items of user #5,924 (highlighted in blue), including relational triples between items and entities. Figure 1 compares the recommended item lists generated by the baseline RecRanker and KERAG_R. From Figure 1, we observe that the models recommended "Space Jam" (highlighted in red as the ground truth) for user #5,924. Notably, KERAG_R ranks "Space Jam" at the top of the list, higher than RecRanker. This superior ranking performance is attributed to the use of relational knowledge in our KERAG_R model. Indeed, the item-entity relationships in Figure 1 show the potential reason for this improved performance. For instance, the triple "Space Jam - film.character - Herbie" helps the used LLM recognise the character "Herbie". This recognition is significant because the user's preference for movies featuring distinctive and beloved characters, such as those in "The Lion King" and "Toy Story," suggests a similar affinity for "Space Jam," which also features engaging characters. Additionally, the triple "The Lion King - film.story_by - Noni White" reveals that one of the user's liked movies has been written by Noni White, who has also contributed to other popular films such as "Tarzan." This connection underscores common themes of animation and family entertainment, which are also prevalent in "Space Jam." As a result, the introduced relational knowledge provides our KERAG_R model with rich domain-specific knowledge, thereby enhancing the top- k recommendation performance.

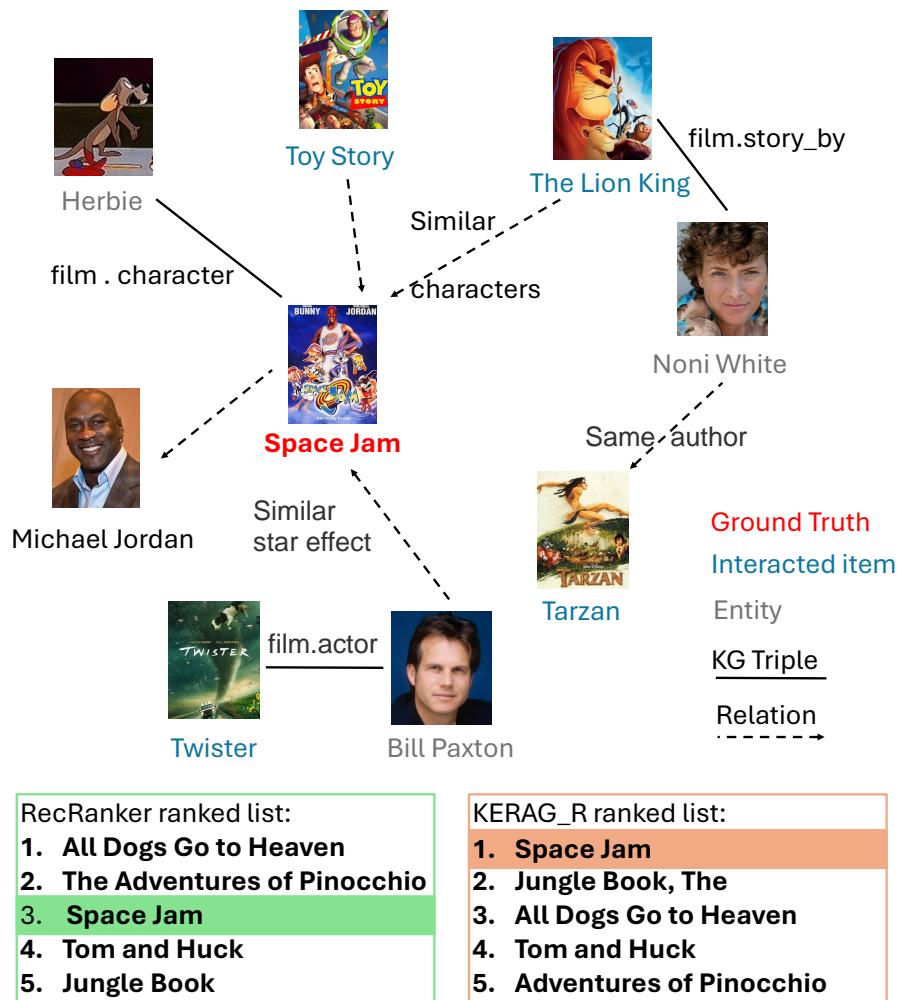


Figure 1: Case study on user #5,924 in the ML-10M dataset