Song Recommendation combing LLM and recommender

focus on both semantic and behavior characteristic

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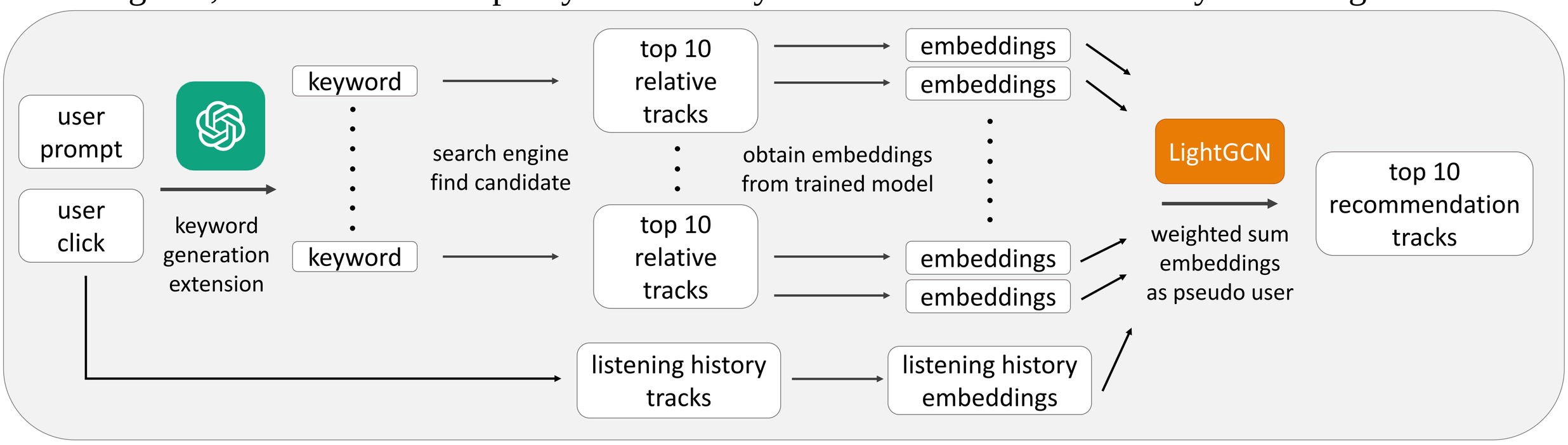
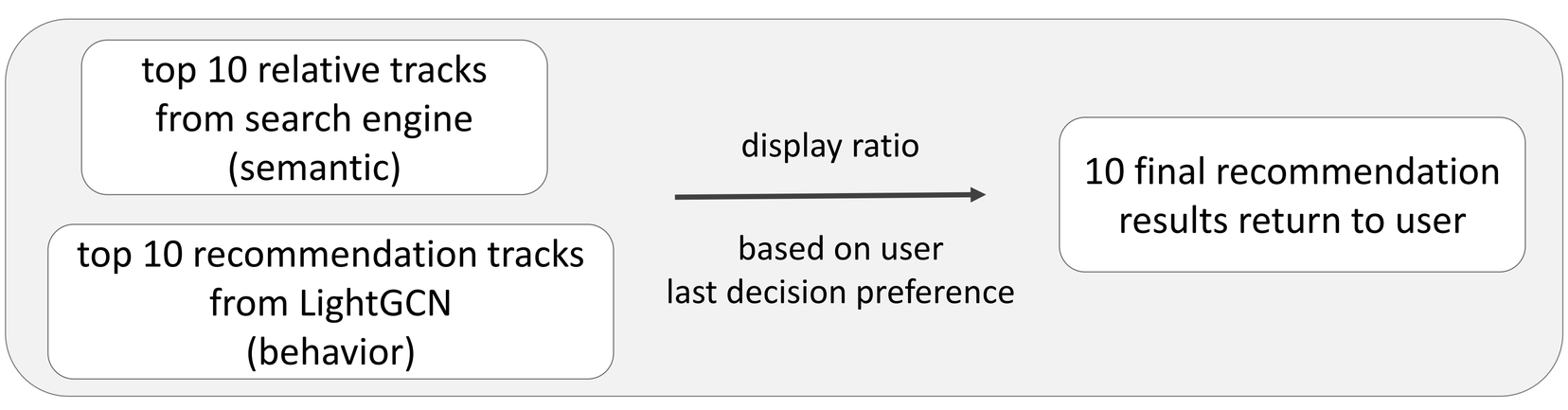
Motivation & Discovery

More and more algorithms are introduced to the search engine and streaming music and video. Most of the existing recommendation directly based on the search keyword or your listening history, only a few tries would tell you some out of zone results. Somehow, these recommendations are the one brought us to a new field that unexpectedly match out taste and fascinated about. With the development of LLM that understand and extracts the human language, I would like to combine it with the traditional collaborative filters to introduce another recommendation result to increase the diversity of the recommendation.

Methodology & Experiments

Use ChatGPT API as the LLM model to extract the semantic from keywords and train a LightGCN model for collaborative filtering to predict the user behavior. The experiment is run on a 30,000 playlists subset including 337,683 tracks of the Spotify Million Playlist Dataset released on RecSys Challenge 2018.



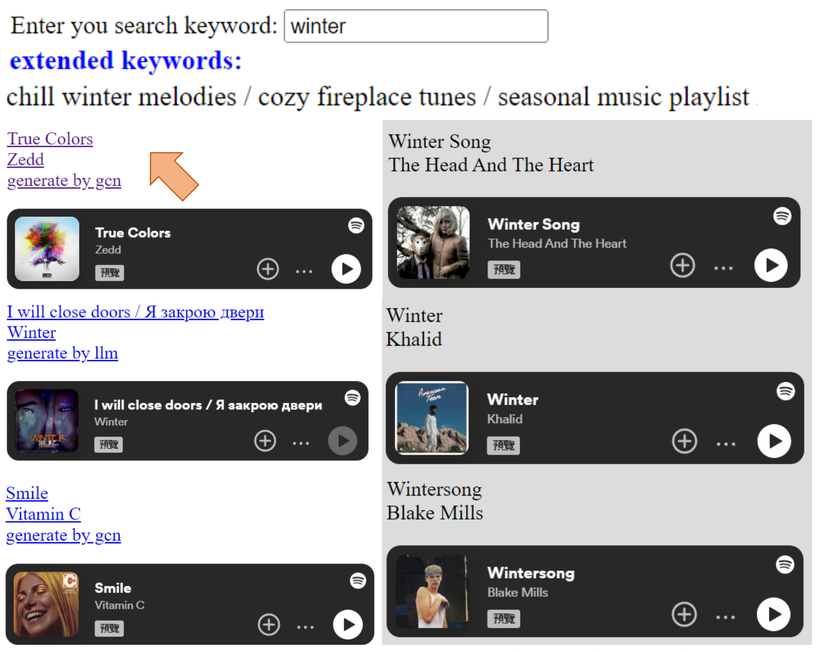


Model Setting

- LLM: ChatGPT 3.5 turbo
- LightGCN: LibRecommender library
  - 3 layers; 100 epochs
  - learning rate: 0.001
  - eval recall@300: 0.4548
  - test recall@300: 0.0771

Results

The returning results are rational but different from the existing YouTube and Spotify recommendations. They still belong to the same genre of music but do not always stick to the match of the keyword on titles or artists which delivers more surprises and learns the user preference.



▲our approach

▲Spotify search

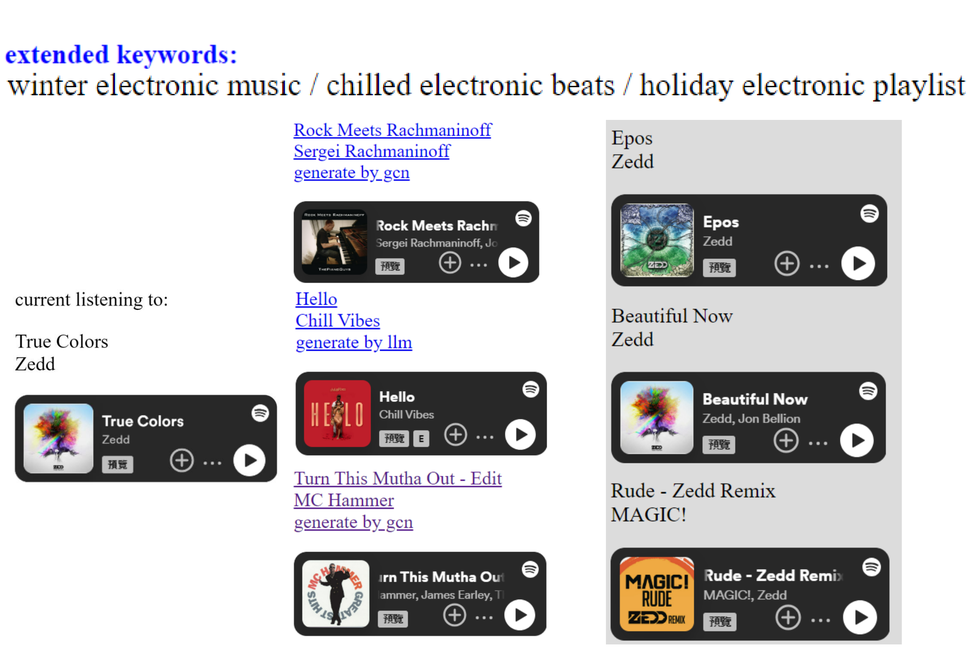
Our approach:
- Artist name “winter”
- Tracks follow the extended keyword

Spotify:
- Track title with “winter”

user prefer the extended keyword track

Our approach:
- Keywords based on the listened track
- More results with the same genre
- Remain the similar keyword

Spotify:
- recommend tracks by the same artist



▲our approach

▲Spotify recommendation