AN MPD PLAYER WITH EXPERT KNOWLEDGE-BASED MUSIC RECOMMENDATION

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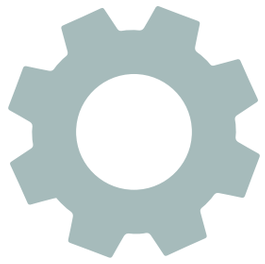
OUR GOAL

- An album-centered hi-fidelity music player based on the MPD protocol
- Providing music recommendation mechanism for music lovers who do not use online music service
  - No others' logs are available for the recommendation models based on the collaborative approach.
  - No full-covered audio contents are available for the content-based recommendation that analyzes acoustic information.

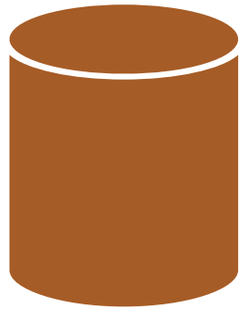
SOLUTION TO THE PERSONALIZED MUSIC RECOMMENDATION

- Knowledge Base + Single Individual's Behavior

Music Knowledge Base



Playback Log



Personal Music Collection

MUSIC KNOWLEDGE BASE

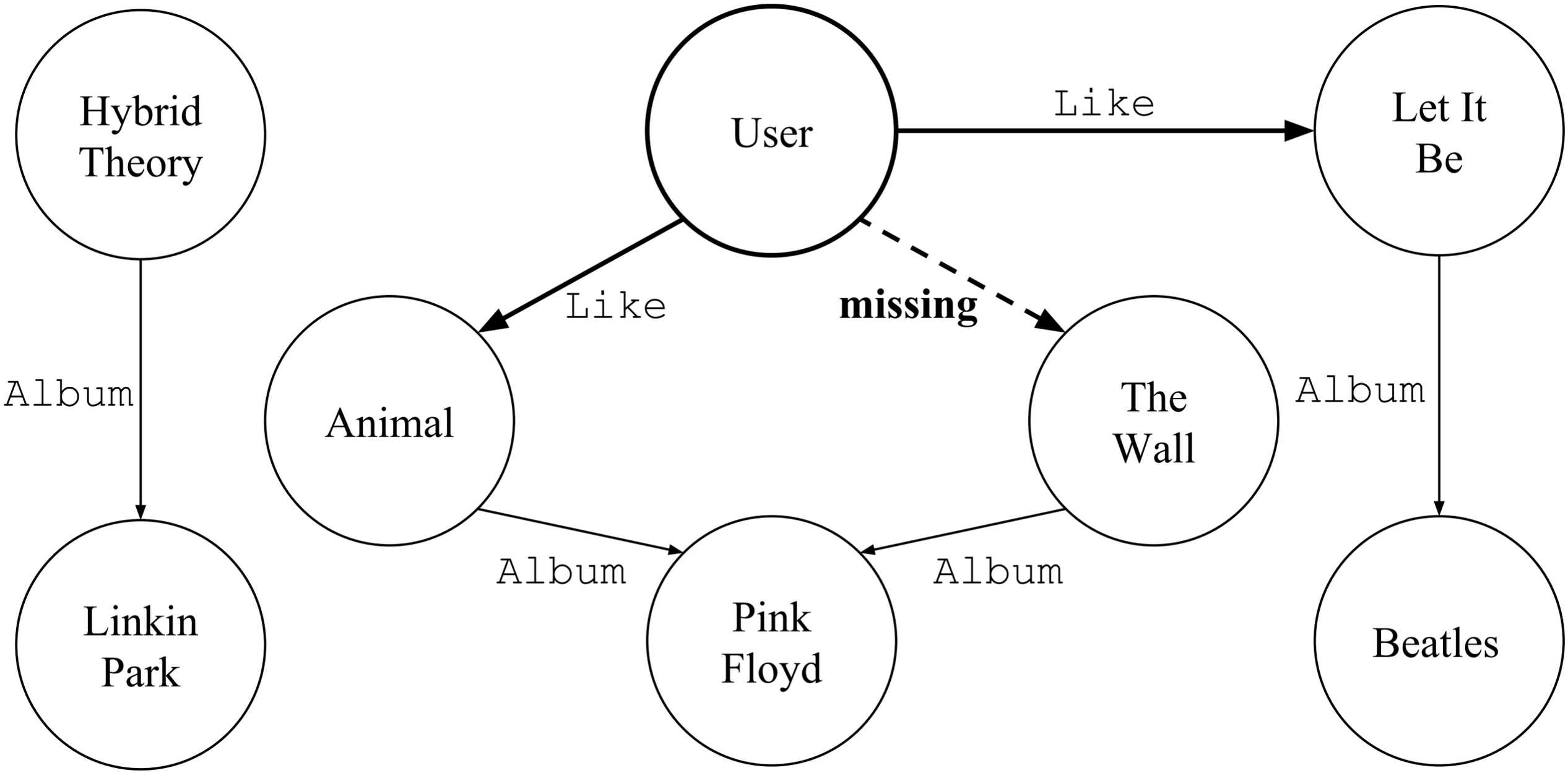
Entity Type	Instances	Samples
Artist	11,162	The Beatles, Bob Dylan, U2
Album	79,488	Revolver, The Wall, Achtung Baby
Theme	187	Introspection, Reflection, Late Night
Mood	295	Playful, Reflective, Earnest
Style	776	Alternative, Indie Rock
Genre	21	Pop/Rock, R&B, Electronic, Jazz

➤ A total of 91,929 entities and 527,121 factual triples

MUSIC KNOWLEDGE BASE

Relation Type	Explaination
Albums	The albums of the artist
Influencers	Artists who influenced the artist
Followers	Artists who followed the artist
Group Members	Artists who are the group member of the artist
Associated with	Artists who are associated with the artist
Collaborative with	Artists who have ever collaborated with the artist
Similars	Similar artistsartist
Moods	Moods usually expressed in the artist's albums
Styles	Styles of the artist
Themes	Themes usually cared about by the artist
Genre	Genre of the artist

RECOMMENDATION AS KNOWLEDGE BASE COMPLETION



Head Entity + Relation ≈ Tail Entity

$$\Rightarrow \begin{cases} \text{User} + \textsc{Like} \approx \text{Potentially favorite albums} & \text{for album recommendation} \\ \text{User} + \textsc{Like} \approx \text{Potentially favorite artists} & \text{for artist recommendation} \end{cases}$$

EVALUATION

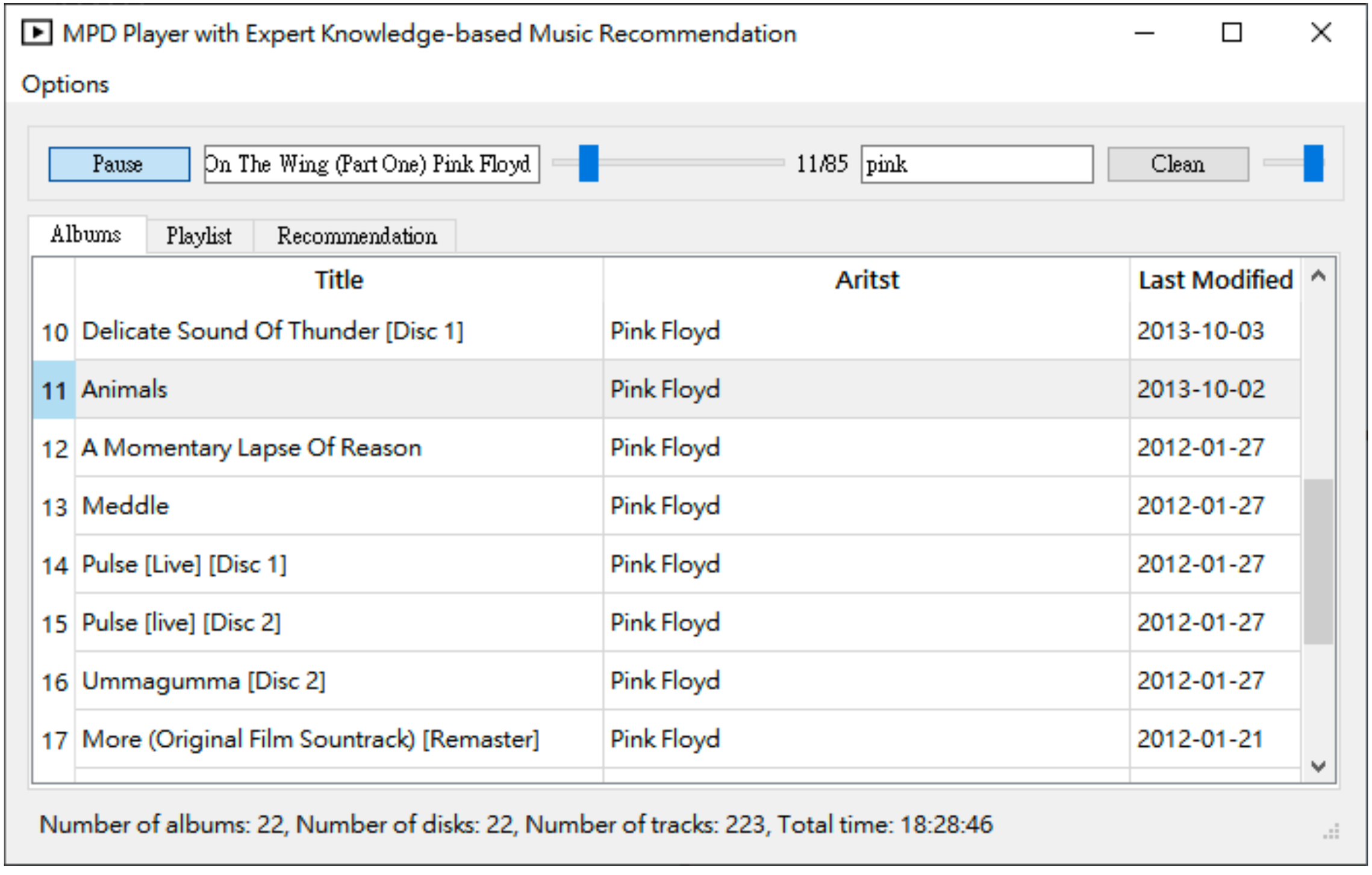
Task	k	Accuracy	MRR
Next Artist	4	0.667	0.799
Next Artist	10	0.500	0.638
Next Artist	50	0.167	0.290
Next Album	4	0.619	0.802
Next Album	10	0.476	0.666
Next Album	50	0.333	0.475

IMPLEMENTATION

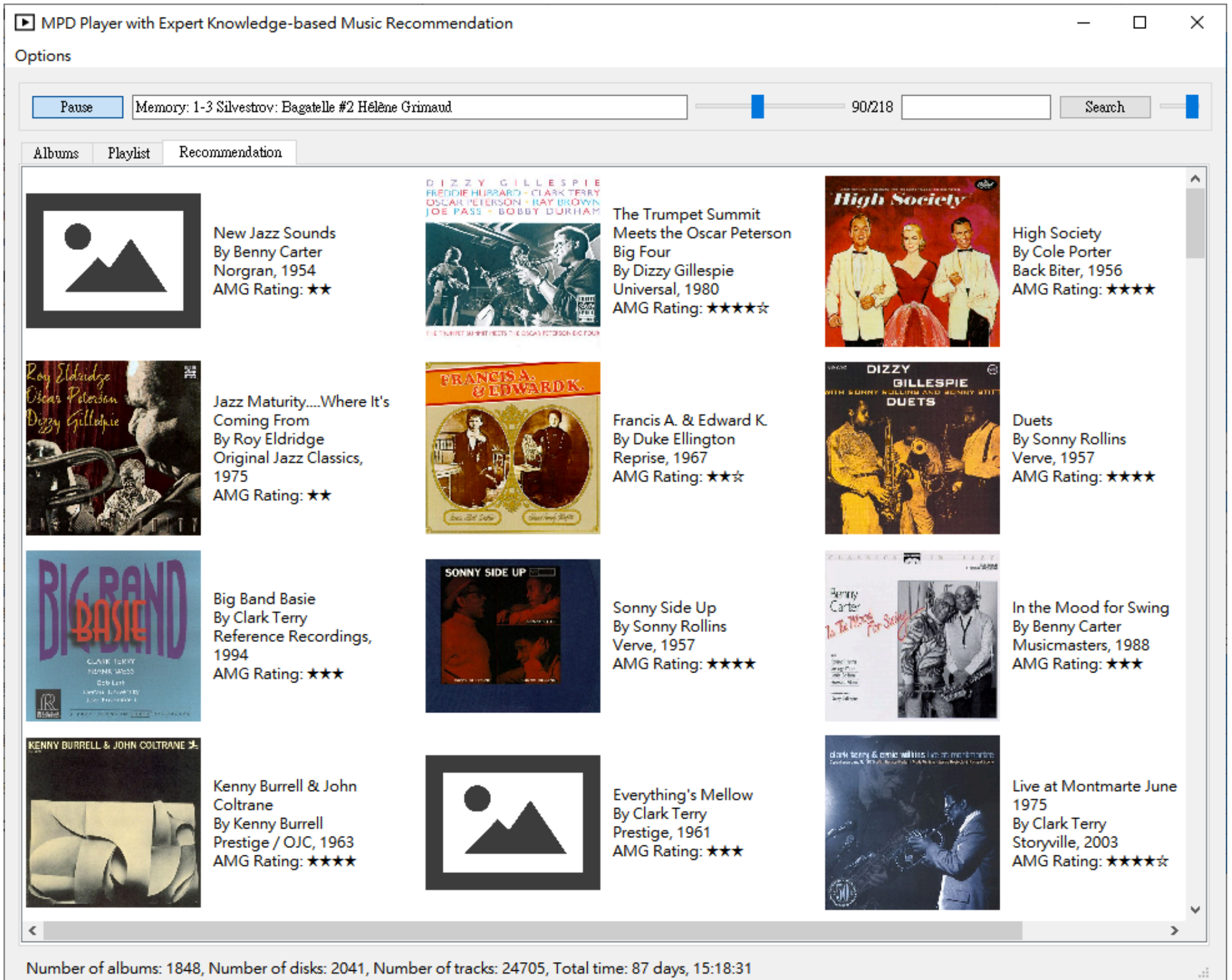
- The player is built for MPD (Music Player Daemon), which is the most popular audio streaming protocol for audiophiles.
- The recommendation system is written in Python with the OpenKE toolkit for training the knowledge embeddings.
- The player is written in Python with QT5 with its visual elegance and possibility of cross-platform.
- The player and the recommendation system is open source for the research community and the music lovers.

https://github.com/hhhuang/mpd_player/

THE PLAYER WITH A SLIM, MINIMAL INTERFACE



RECOMMENDATION



CONTRIBUTIONS

- An alternative approach to music recommendation
  - Integrating expert knowledge, experimental results show the effectiveness of our model.
- Our model for personalized music recommendation is free from the issue of bandwagon effects
- We release our MPD player with the music recommendation model as an open-source software for the research community and the music lovers who object to be controlled by the giant companies