Deep Content-User Embedding Model for Music Recommendation

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Introduction

- Recently deep learning based recommendation systems have been actively explored to solve the cold-start problem using a hybrid approach.

- The end-to-end approach that takes different modality data as input and jointly trains the model can provide better optimization but it has not been fully explored yet.

Problem

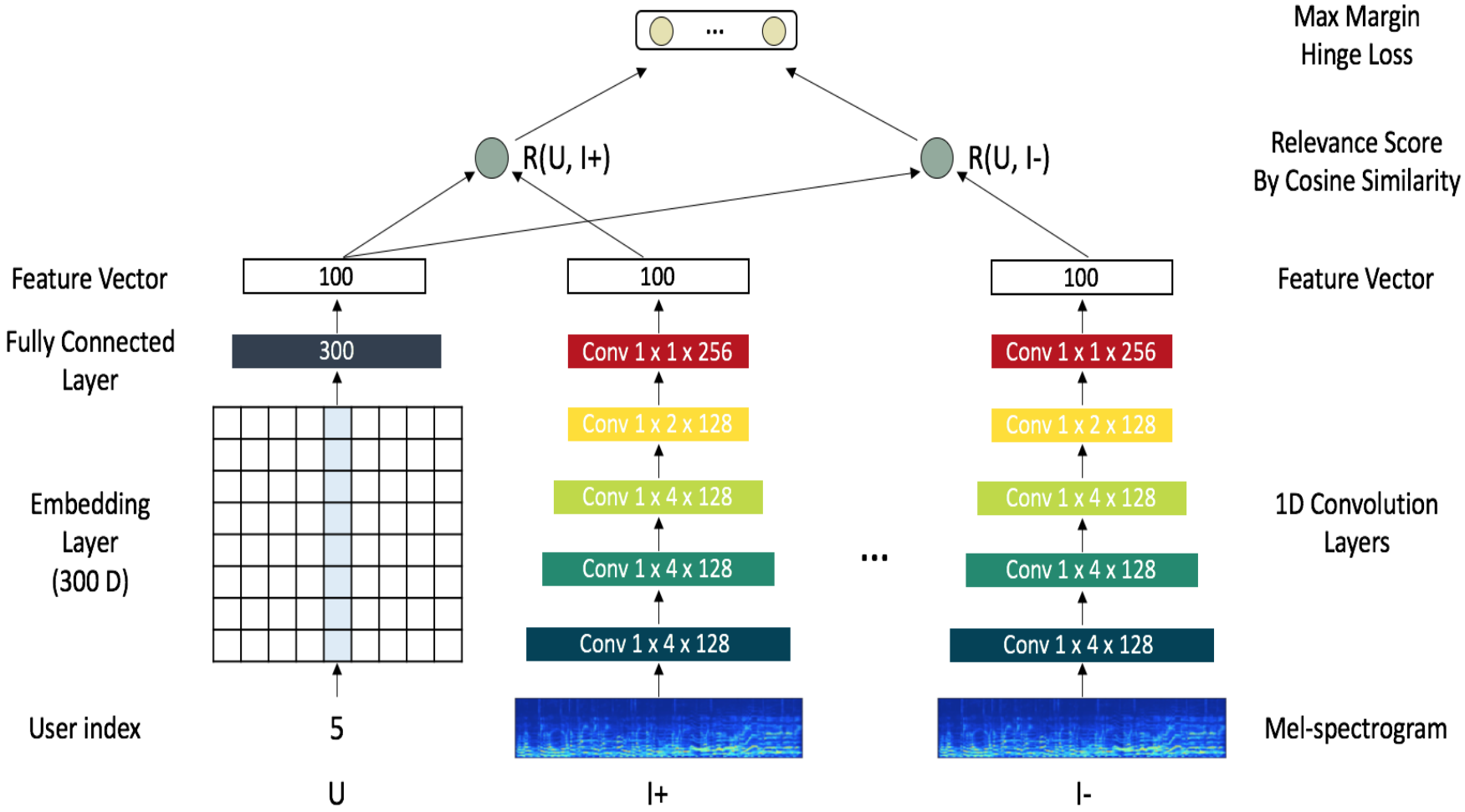
- Cold Start

Issues:

- The following issues should be considered when configuring the model architecture.

- The first layer configuration on the user side to handle large number of users
- Method to combine the user and item feature vectors
- Loss function and training strategy

DEEP CONTENT-USER EMBEDDING MODEL



- DATA SET
- Training Details

EVALUATION

- Task1 : Music Recommendation

Table 1: Music recommendation results.

Type	Models	AUC
–	Popularity	0.7059
CF	WMF	0.9302
Hybrid	WMF+Regression [19]	0.6967
Hybrid	Deep Content-User Embedding Model	0.7914

EVALUATION

- Task2 : Music Auto-Tagging

Table 2: Music auto-tagging results.

Type	Models	AUC
CF	WMF	0.8683
Hybrid	WMF+Regression [19]	0.7876
Hybrid	Deep Content-User Embedding Model	0.8450

CONCLUSION

- They presented the deep content-user embedding model to simultaneously learn the user-item interaction and unstructured audio data in an end-to-end fashion. They proposed model consists of the user and item sides, each of which takes user index and multiple audio as input, respectively.
- They also discuss various directions to improve the proposed model further.