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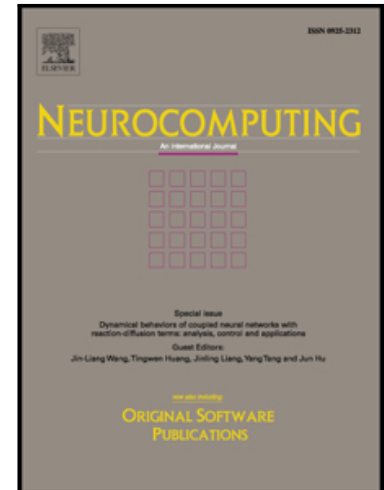
Chu Guan, Yanjie Fu, Xinjiang Lu, Enhong Chen, Xiaolin Li, Hui Xiong

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Efficient Karaoke Song Recommendation via Multiple Kernel Learning Approximation

Chu Guan^a, Yanjie Fu^b, Xinjiang Lu^c, Enhong Chen^a, Xiaolin Li^d, Hui Xiong^c

^a*University of Science and Technology of China*

^b*Missouri University of Science and Technology*

^c*Rutgers University*

^d*Nanjing University*

^e*Northwestern Polytechnical University*

Abstract

Online karaoke allows users to practice singing and distribute recordings. Different from traditional music recommendation, online karaoke need to consider users' vocal competence besides their tastes. In this paper, we develop a karaoke recommender system by taking into account vocal competence. Along this line, we propose a joint modeling method named MKLA by adopting bregman divergence as the regularizer in the formulation of multiple kernel learning. Specially, we first extract users' vocal ratings from their singing recordings. Due to an ever-increasing number of recordings, the evaluations in large-scale kernel matrix may cost lots of time and internal storage. Therefore, we propose a sample compression method to eliminate users' vocal ratings, exploit an MKL method, and learn the latent features of the vocal ratings. These latent features are simultaneously fed into a bregman divergence and then we use the trained classifier to predict the overall rating of a user with respect to a song. Enhanced by this new formulation, we develop the SMO method for optimizing the MKLA dual and present a theoretical analysis to show the lower bound of our method. With the estimated model, we compute the matching degree of users and songs in terms of pitch, volume and rhythm and recommend songs to users. Finally, we conduct extensive experiments with online karaoke data. The results demonstrate the effectiveness of our method.

★Corresponding authors email: cheneh@ustc.edu.cn, fuyan@mst.edu

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