

School of Information Systems

VenueMusic: A Venue-Aware Music Recommender System

Zhiyong Cheng, Jialie Shen

Research Motivation

- Music Consumption Trends: People increasingly use the handheld devices to access music contents on the move.
- Local Music Preferences: Users' music preferences can be influenced by where they are and surrounding environments.
- Streaming Music Contents: "On-demand streaming up 54% with 164 billion streams in 2014" 2014 Nielsen Music U.S. Report

System Overview

Main objective: develop an intelligent music recommender system to automatically *identify suitable music for various*

Prototype Interface

VenueMusic system prototype is implemented on Android platform (Android Version 4.4, 2GB RAM, Samsung A7)

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VenueMusic		۹	2	:
My Playlis	ts			>
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VenueMusic	ed			>
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Bedroom				>
Gym				
Library				>
Office				>
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Dido	Life For Rent Dido		3:41			
ADELE	Someone Like Yo Adele POP	bu	4:47 > 8.03			
	Love To See You Enrique Iglesias Folk	Cry	4:07 > 8.24			
RIHANNA	Love The Way Yo Rihanna POP	ou Lie	4:23 7.55			
	Show me the me Backstreet Boys	aning	3:56			
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popular venues in our daily lives (e.g., library, gyms, etc.).

- VenueMusic system consists of two major components: (1) Music Concept Sequence Generation, (2) Location-Aware Topic Model (LTM).
 - Music Concept Sequence Generation: (1) represent each music track as a sequence of music semantic concepts using concept detection methods; (2) improve the quality of detected concepts with a *two-step filtering* process
 - Location-Aware Topic Model: extract latent topics from musicvenue pairs and represent venues and music tracks with these latent topics



VenueMusic System Architecture

Location-aware topic model explains the underlying reasons why people prefer certain music in a venue by:



System Performance

- A comprehensive user study aims to compare VenueMusic with various competitors on recommendation accuracy over eight common venues:
 - Audio-Based Content Filtering (ABCF)
 - Concept-Based Content Filtering (CBCF)
 - Concept-based LTM without concept filtering (CLTM)

Venue	ABCF	CBCF	CLTM	VenueMusic
Bar	0.95	0.85	0.95	0.95
Bedroom	0.25	0.45	0.55	0.65
Gym	0.40	0.45	0.55	0.65
Library	0.35	0.60	0.60	0.65
Office	0.40	0.45	0.45	0.50
Restaurant	0.30	0.20	0.30	0.30
Mall	0.15	0.35	0.30	0.45
Bus/Train	0.20	0.50	0.45	0.55

- modeling latent topic as a mixture of music concepts
- modeling music track or venue as a mixture of latent topics



Location-Aware Topic Model

Recommendation Accuracy Comparison

- It demonstrates the *superiority of semantic topic* representations
- The results verifies the effectiveness of using concept filtering process to *improve the concept representation quality*

Acknowledgements

• The research is jointly supported by Singapore Ministry of Education under Academic Research Fund Tier-2 (MOE Ref: MOE2013-T2-2-156), Microsoft Research grant (FY14-RES-OPP-048) and ACM SIGIR2015 Student Travel Award.