Online Recommender System for Radio Station Hosting

Dmitry I. Ignatov\textsuperscript{1}, Andrey V. Konstantinov\textsuperscript{1}, Sergey I. Nikolenko\textsuperscript{2,3}, Jonas Poelmans\textsuperscript{1}, and Vasily V. Zaharchuk\textsuperscript{1}

\textsuperscript{1} National Research University Higher School of Economics
dignatov@hse.ru
http://www.hse.ru
\textsuperscript{2} Steklov Mathematical Institute, St. Petersburg, Russia
\textsuperscript{3} St. Petersburg Academic University, St. Petersburg, Russia

Abstract. We describe a new recommender system for the Russian interactive radio network FMhost. The underlying model combines collaborative and user-based approaches. The system extracts information from tags of listened tracks for matching user and radio station profiles and follows an adaptive online learning strategy based on user history. We also provide some basic examples and describe the quality of service evaluation methodology.

Keywords: music recommender systems, interactive radio network, e-commerce, quality of service.

1 Introduction and Related Work

Music recommendation is an important topic in the field of recommender systems. Recent works in this area can be found in the proceedings of the International Society for Music Information Retrieval Conference (ISMIR) \cite{1}, the Workshop on Music Recommendation and Discovery (WOMRAD) \cite{2,3}, and the Recommender Systems conference (RecSys) \cite{4}. Several broadcasting services including LastFm, Yahoo!LaunchCast and Pandora are well known and work on a commercial basis. The latter two of them do not broadcast for Russia. Despite the many high-quality papers on different aspects of music recommendation, there are only few studies devoted to online radio station recommender systems.

This work is devoted to the Russian online radio hosting service FMhost and, in particular, its new hybrid recommender subsystem. Recently, the focus of computer science research for the music industry has shifted from music information retrieval and exploration \cite{5,6,7} to music recommender services \cite{8,9}. The topic is not new (see, e.g., \cite{10}); however, it is now inspired by new capabilities of large online services to provide not only millions of tracks for listening to, but even radio station hosting. Social tagging is also one of the important factors which allows to apply new tag-similarity based recommender algorithms to the domain \cite{11,12}.
Recently, a widely acclaimed public contest on music recommender algorithms, KDD Cup, was held by Yahoo! (http://kddcup.yahoo.com/). In KDD Cup, track 1 was devoted to learning to predict users’ ratings of musical items (tracks, albums, artists and genres) in which items formed a taxonomy. Each track belonged to an album, albums belonged to artists, and together they were tagged by genres. Track 2 aimed at developing learning algorithms for separating music tracks scored highly by specific users from tracks not scored by them. It attracted a lot attention from the community to problems which are both typical for recommender systems and specific for music recommendation: scalability issues, capturing the dynamics and taxonomical properties of items [13]. The current trends of music recommender systems reflect advantages of hybrid approaches and show the need for user-centric quality measures [14]. For instance, in [15] an interesting approach based on a “forgetting curve” to evaluate “freshness” of predictions was proposed. In [16], the authors posed an important question, namely how much metadata do we need in music recommendation, and after a subjective evaluation of 19 users the authors concluded that pure content-based methods can be drastically improved by using genres.

In [17], the authors proposed the music recommender system Starnet for social networking. It generates recommendations based either on positive ratings of friends (social recommendations), positive ratings of others in the network (non-social recommendations), and it also makes random recommendations. Another interesting online music recommendation system we can mention is Hotttabs [18], dedicated to guitar learning. Some authors aim at improving music recommender systems by using semantic extraction techniques [19,20]. In [21], the author describes a system of genre recommendation for music and TV programs, which can be considered as an alternative channel selector. The authors of [22] proposed a recommender system GroupFan which is able to aggregate preferences of group users to their mutual satisfaction.

Many online services (e.g., Last.fm or LaunchCast) call their audio streams “radio stations”, but in reality they produce a playlist from a database of tracks based on a recommender system rather than actually recommend a radio channel. FMhost, on the other hand, provides users with online radio stations in the classical meaning of this term: there are human DJs who perform live, a radio station actually represents a strategy or mood of a certain person (DJ), they play their own tracks, perform contests etc. Thus, the problem we are solving differs from most of the work done in music recommendation, and some of the challenges are unique.

The paper is organized as follows. In Section 2 we describe our online radio service FMhost. In section 3 we propose our new recommender model, two basic recommender algorithms, and describe the recommender system architecture. Quality of Service (QoS) measurement for the system and some insights on FMhost user behaviour are discussed in Section 4. Section 5 concludes the paper.