

# GLOBAL ACCESS TO ETHNIC MUSIC: THE NEXT BIG CHALLENGE?

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## ABSTRACT

Although MIR is a relatively new branch of research, it has already approached several musical parameters and many musical styles, using different methodologies, from low-level signal analysis up to higher-level symbolic and semantic approaches.

Several implementations have come forward, but when we want to apply these tools to ethnic music we are often confronted with fundamental problems. This music mostly does not rely on the common Western musical concepts. Therefore most MIR-applications need to be redesigned in order to give a relevant contribution to the analysis and classification of non-Western music.

In an interdisciplinary approach, engineers and ethnomusicologists should be able to achieve considerable progress in the approach of music that lacks commercial means and is difficult to access for the general public. Developers can find new challenges, while the development of interesting tools can give a new impulse to the study and dissemination of a rich heritage of music now hidden in archives.

## 1. INTRODUCTION

The systematic study of ethnic music has started in the late 19<sup>th</sup> century. From then on, field work has been conducted all over the world, and numerous sound recordings have been made and documented. However, retrieval and access of ethnic music audio documents is an area that did not get a lot of attention until recently. Worldwide, thousands of cultures have developed their own musical culture, with specific qualities and specific purposes. This makes the field of ethnic music very broad, with a whole range of different timbres, moods, styles, instruments and musical characteristics. Different cultures also develop a different attitude towards music as a phenomenon, which implies that western musical concepts do not always fit ethnic music, thus in many cases music as a concept is not separable from e.g. movements (dance) or texts. Yet, a written conceptual framework of the music is mostly not present. Some ‘classical’ traditions, as found e.g. in India or the Middle-East, do have a music theory that allows classification according to established concepts (though still fundamentally different from western concepts), but in

many cultures music exists without any common theoretical ground. So, mostly, the musical system is not as well-defined as it is for Western music, which makes it hard to set out general rules for analysis.

Besides the enormous variety and the lack of a theoretical framework, a third element that complicates the access to ethnic music is its distribution. A lot of musical cultures are under strong pressure of Westernization; the traditional music thus became a fragile cultural heritage. It is not produced in a commercial circuit in which labelling and classification are omnipresent. Rather, ethnic music is collected by researchers and gathered in archives, which are often not digitized and thus not easily accessible. Sometimes entire collections are really badly documented, and even if the documentation is fully available, the metadata fields are focused on different descriptive aspects than is the case for Western music. Moreover, spelling and terminology may vary. All these cause a lack of coherent ground truth, which makes larger scale research very difficult.

Before going further into the problems and opportunities in the application of MIR techniques in ethnic music, we should define more exactly what we mean with ethnic music, as it is does not point to a specific musical style, but is a term used to group a myriad of different styles and genres.

## 2. WHAT IS ETHNIC MUSIC?

As ethnic music is not a category that exists as such, but rather a kind of meta-category under which music with completely different origins, functions and musical characteristics is grouped, it is difficult to give a precise definition. Moreover, in common practice there is often a confusion between ethnic music in strict sense, which comprises the music of cultures without written tradition and the broader subject field of ethnomusicology which commonly also includes non-Western classical music, the religious and court music of cultures with a written musical culture, such as China, India or the Middle-East, and folk music, which can be defined as music from cultures with a written musical culture that does not belong

to the classical tradition. The latter category is not restricted to Western folk music, but e.g. also includes Japanese folk songs. Here we see another common point of confusion, namely that between ethnic and non-Western. Some Western music can be called ethnic (at least if we want to include folk music), while some non-Western music is modeled to Western popular or classical music. Sometimes it is difficult to draw a line, as traditional style characteristics often show up, both in works of non-Western classical composers and in local styles of popular music. From the viewpoint of MIR, the main distinction would be in whether or not the music is produced for distribution outside the immediate community. Therefore we exclude any form of notated music as well as commercial popular music, even if it concerns non-Western (e.g. Chinese or Brazilian) popular music or Westernized styles of 'world music'.

### 3. ACCESS TO ETHNIC MUSIC

#### 3.1. Collection and storage of ethnic music

Following our definition, ethnic music is produced for use within the community and not for a broader distribution. Scores and recordings are originally not part of the musical culture, but are made by visiting ethnomusicologists. These recordings are not primarily meant for distribution, rather for preservation and research. Consequently, they are stored in archives and historical collections, mostly on a mix of different types of carriers. In recent years efforts have been made to start up digitization projects, but this did not always improve the accessibility, as the files are still part of (closed) collections of institutes or musea. Popular music has a strong link with commercial, industrial activities, steering mutual interaction with technological innovation and societal development. Ethnic music is considered as a museum artefact, a silent memory of an oral culture. It thus needs governmental financial support, and it strikes that (governmental) institutions from different countries tend to follow different policies for presentation, access and storage which makes it even harder to develop fitted research tools.

#### 3.2. The access path itself

Access path to music is the path that exists between a search idea and the delivery of an audio file, with its associated contextual information. The search and retrieval of ethnic music requires strategies that deal with a large variability of music, users, search intentions and expectations. The music's metadata can be fundamentally different from Western standards, and the individual users can have very different backgrounds and have very different intentions in searching certain music. We could distinguish three groups [1]: (1) people from the general public with an interest in ethnic music, but without a very elaborate background. These users typically want to retrieve music using a rather vague and general labelling,

such as 'drumming', 'trance music' or 'some song from Rwanda'. A second group consists of users from within the culture. They may have a good knowledge of certain repertoires and functions of the music, and therefore, they tend to ask very specific questions such as: music played by a specific performer, music from one particular village, lyrics, genres, instruments (in local terminology). Finally, the third group of users consists of researchers, who use the database for further study. This group would typically tend to ask questions related to the geographical spread of certain instrument types, or the relative importance of certain rhythmic or pitch musical structures in different regions.

### 4. MIR AND ETHNIC MUSIC: A COLORFUL BLEND?

Currently, Music Information Retrieval tools have mainly been developed for Western popular and classical music. Ethnic music does however have a link with MIR. Some aspects of the traditional ethnomusicology can claim some commonalities with MIR: audio (field) recordings take a central place in ethnomusicology, leading to collections of audio recordings with their associated meta-data. Ethnomusicologist always had to develop methods to analyze and transcribe these recordings, aiming at a comparison and classification of the music.

The potential of computational research within the context of ethnic music has been stressed by the introduction of the term 'Computational Ethnomusicology' [2]. Ethnomusicology is by nature an interdisciplinary research field, in which diverse fields like musicology, anthropology and acoustics come together. The existence of large audio collections invites to develop automated approaches and its complex contents urges for the development of domain specific techniques to approach the particular characteristics and constraints of different ethnic music styles.

### 5. MIR POTENTIAL

Music Information Retrieval offers a lot of new potential for researching ethnic music. The challenges can be divided into three very different areas, that can act as methodology: i) low-level based signal processing, ii) high-level research on interpreted and structured audio-data, iii) metadata based retrieval.

- Low-level signal processing extracts information directly from the audio signal. This can give us characteristics of the music, without the need for a theoretical framework, which is very helpful for approaching music of which the structural characteristics are not well-defined. Eventually, this can lead to a query-by-example system, allowing to retrieve music which is largely unfamiliar to the users. Some papers published within the ISMIR community do work on this low-level signal processing [3][4][5].

- The second type of research would focus more onto the interpretation of the music. Within this methodology two paradigms can be handled: A model-driven paradigm starts from analysing specific musical parameters, refining the tools towards the model put forward. This type of model can be used on smaller sets of audio in order to obtain a very detailed description of the sets, but can not easily be transferred to another collection of music, with very different characteristics. On the other hand, a 'serendipity-paradigm' aims to analyze and optimize the algorithms without any steering theoretical framework, but relying on the potential of the merging of tendencies, patterns and similarities when working on large sets of audio. This type of approach allows more flexibility and the treatment of heterogeneous materials, but can not lead to very specific classifications. Papers depending on the model-driven paradigm [6][7] and on the serendipity paradigm [8][9] can be found.

- The third area focuses on flexible data querying. Current tools for query-by-data can be used but need to be extended because the meta-data of ethnic music focuses on other aspects. For example, it is usually not relevant for ethnic music to search for composers and genres, while it is of utmost importance to search for geographical information and social relevance (function). Another remarkable aspect is the lack of standardisation of spelling in the ethnic context, needing a flexible searching tool, using fuzzy logic techniques. A few papers within ISMIR deal on the description of meta-data [10], but no efforts within the field of flexible data querying.

## 6. MUSICAL PARAMETERS

Pitch organisation reveals the most obvious example of the shortcoming of Western music theory and notation in the field of ethnic music. In ethnic music, the 100 cents based scale is not an absolute factor, and other ways to describe pitch intervals are necessary to grasp the through pitch organization of the music. Some interesting work can be found on actual used pitch scales [1][6]. Aside of the problematic of pitch distribution, in some cultures even the notion of discrete pitch categories is not appropriate. In some cases, a continuous pitch organisation, based on sliding pitches, leading to an organisation in prototypical musical gestures is more adequate [11][12].

Timbre is a musical parameter that can be investigated by low-level signal processing, but can also fit within the serendipity paradigm as described above. Fact is that timbre doesn't have a strict underlying theoretical framework. Semantically, only few words can be connected with timbre aspects. Mostly such matter is i) described in metaphorical terms or ii) displayed in the form of self-organising maps [3][9].

Despite well-organised underlying theoretical structures, the phenomenon of temporal perception can be ambiguous even in a Western perspective [13]. In some cases the

analysis of the movements associated with the music, gestures, spoken word and dance come together to form the correct rhythmic interpretation [14] [15]. Summarising, reducing concepts and characteristics of ethnic music onto familiar Western musical parameters may lose much of the rich, dynamic and lively texture of this music because of the different underlying structural development.

## 7. FUTURE WORK

Although ethnic music did not get so much attention in the Music Information Retrieval community, the existence of large archives, with complicated and often deficient meta-data, provides a great potential for MIR applications. Ethnic music is not only a unique environment of new timbres, rhythms and textures, it is also a fragile cultural heritage that can surely use some specialised research in order to be easier and better accessible. The aspect of innovation may be another argument for attracting new researchers, because only few tools are available and such research full of new challenges can form a new branch within the MIR community. In the end this effort seems to be necessary to achieve the goals stated in Downie's [16] definition of Music Information Retrieval: "MIR is a multidisciplinary research endeavor that strives to develop innovative content-based searching schemes, novel interfaces, and evolving networked delivery mechanisms in an effort to make the world's vast store of music accessible to all."

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