MUSICSTRANDS^{TM}: A PLATFORM FOR DISCOVERING AND EXPLORING MUSIC

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ABSTRACT

MusicStrands^{TM}has launched a platform devoted to the discovery and exploration of music for the end-user. The services are freely accessible through our web site `www.MusicStrands.com`. The goal of this demonstration paper is to describe the main services offered by our proprietary technology which is based on Artificial Intelligence techniques to encode and predict musical users tastes. Our technology allows users to better enjoy music by facilitating the process of discovering and exploring new music.

1. INTRODUCTION

Even though the internet today offers several online music stores that allow people to access all kinds of music, the process of exploring and discovering music has become more and more challenging for Internet users. Nearly all digital music browsers require users to explicitly specify a query in order to find music, for example by giving an artist name, the title of a song, and so on. However, it is obvious that if a user is interested in discovering new music, he may not be able to specify any concrete query. In this situation and context, the traditional keyword-based query search is not ubiquitous for discovering or exploring new music. Furthermore, even if traditional queries based on keywords may sometimes work, they usually return some results uniquely related to the query without any possibility to interact with the system.

MusicStrands^{TM} is offering to users a catalog with more than 4.6 million songs. At the same, time the main idea of MusicStrands^{TM} is to provide to users a more practical and useful set of tools for exploring and discovering music; at the present including such features as search-functionality also when using non-musical terms (not related to either the musical content nor to the artist, album or track); or through several sets of independent recommendations; graphical visualization tools to manage music libraries; or the *Emergent Hits*^{TM} project for tracking consumer trends.

2. MUSIC EXPLORATION

What was that song from that artist of which I have forgotten the name about?

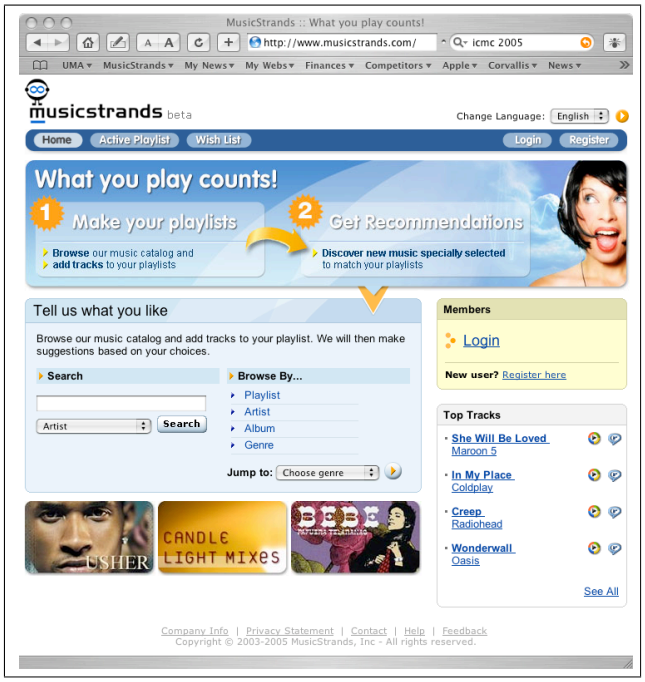

Figure 1. Search and browse through MusicStrands.com

Let us assume that our hypothetical user has found the MusicStrands^{TM}website when searching for a specific music on the internet. Entering the website this is what the user first will see. Its obvious that You can search the database for the artist, track or album that comes to your mind. The results will be presented as lists, with all the albums of a certain artist displayed together with a picture of the original album cover for easier and faster recognition of the desired item. Clicking on the album name or cover, displays all the tracks on the album. It is then possible to listen to clips of each track available in the database; add the track to Your own playlists and/or your wishlist in order to later buy/download the track; to get recommendations; or respond with a subjective rating of a selected track; etc. The MusicStrands^{TM}website offers several types of search:

1. **regular search:** by typing a keyword to match with the content of the database: the options are search for Artists, Albums or Tracks (or any combination thereof) and the possible matches are displayed as a list (often with pictures of i.e., the album or artist

for easier and faster recognition).

2. **user library search:** searching for the alias of a user, displays the entire music library of that user. It is then possible to view each playlists content, read the description (provided the user has written any) and listen to the tracks it contains. MusicStrands^{TM}is also a community of users, where users can view other users personal descriptions of themselves and view the other users personal profiles.

3. **playlist search:** by typing any keyword (also such having nothing to do with either artist, album or track, nor to the musical content take dinner for example) and matching the string to the user database of playlists, in terms of either the playlist description; the events; the moods, or the title of the playlist. It is also possible to search the playlists according to its musical content, such as searching for those playlists containing a certain artist or song.

The basic idea in MusicStrands^{TM}attempts to create better tools for exploring and discovering (searching and browsing) music out of a large database, has been taken from the simple fact that the awareness of the existence of a music in most cases is transferred through music lovers communicating and sharing experiences with each other: one most usually learns about new music and artists through friends and through media, and whenever you find something you like, it is likely that you also want to share that experience with others, and in order to do that you pass the knowledge on to others.

This is basically a collaborative filtering approach: Let a large set of users collect their favorite music from a large database; let them order them; and expose what they have done, such that others can access already filtered items this way.

3. CREATING PLAYLISTS

The very basis for the MusicStrands^{TM}website derives from the construction of playlists. A playlist is any ordered set of tracks chosen from the database, ordered and stored as something the user consider a unit. Every playlist is provided with a name, set by the user; and a description of its content (optional). The users have also the option to associate his/her playlist with a certain mood or event for which the playlist can be used. Other users are then allowed to search for; view and listen to each others music libraries and playlists in order to find music that they too might like.

Since what is shared and stored among users in the MusicStrands^{TM}website is only a symbolic representation of the music basically a link to the track-ID in the database, not the track itself then its possible to whenever you find an item you like you can easily add the same to one of your own playlists. This is why MusicStrands^{TM}is more like an Online Music Library than a shop even though you can buy the items you find (by adding them to your Wishlist)

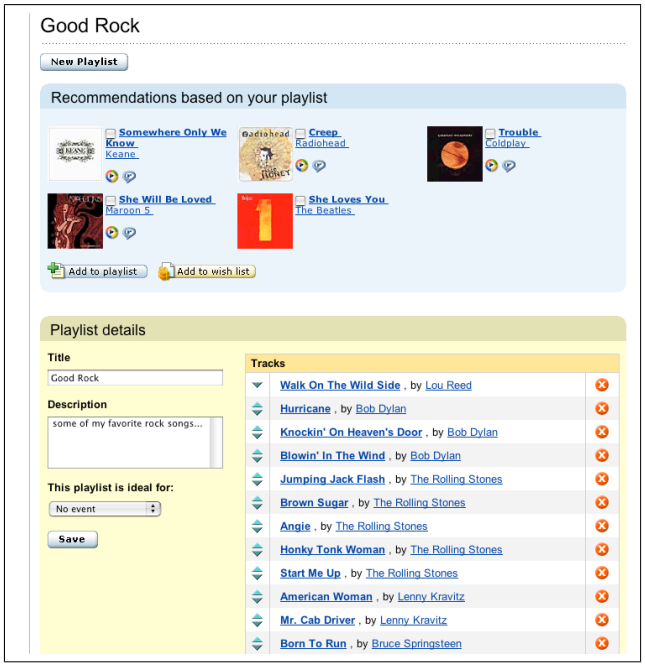

Figure 2. Active Playlist with recommendations.

, you are not at all required to buy them before (or after) storing them in your archive. Since a symbolic representation take very little memory space, the users can store as many items, create as many playlists as they want in their personal archives. This also allows sharing of uploaded personal libraries without giving away for free such tracks You have already payed for.

It is easy to create and edit the order of tracks in the playlist, as well as to listen to the content of the created playlist in order to hear how the songs goes together sequentially.

MusicStrands^{TM}aim is to provide a very dynamical website, and therefore what actions our users perform: as in what they listen to and how frequent (playcounts); or what a user add to his/her playlists and wishlists; is the basis for what we display as recommendations. For every track you add to a playlist, a set of independent recommendations will be displayed. The recommendations displayed are on the track level, and the user can choose to listen to a clip of the track, or to add to his/her playlist or wishlist, or simply ignore if preferred. They are independent in the sense that it, in contrary to some of the recommenders commercially available, they are not dependent on sale-statistics (as in costumers that bought this object also bought this...) and they are never (unless it is clearly stated) sponsored in any way. The recommendations are also personalized so that they are based also on a tracking of the users musical taste or profile, and they are sensitive to changes and evolve together with the changes of the users individual taste.

4. THE MUSICSTRANDS RECOMMENDER^{TM}

Several attempts to not only display the items the user are familiar with, and looking for, but also such that are some-

how related, as recommendations have been done recently. One group of such music recommender systems are entirely audio-content based, which has the problem in common that they require quite heavy audio signal processing techniques for content analyze and feature extraction. Another group of music recommendation systems are based on metadata (derived from users or music experts) such as user ratings, or textual descriptions, assigned to the ID3 tags of the tracks. These systems have the limitation of having to first obtain these metadata and then assign it to every track in the dataset (which can be very large, as in the AMG and MUZE databases for example).

The MusicStrands^{TM}music recommendation system [1] rely on another simple but effective invention: A large quantity of users are the most likely to arrange in their playlists such tracks that they consider belonging together in some sense or another. The tracks that are closer together in a playlist are the most likely to be the most similar, either they are from the same artist or not. Thus, the position of a track in the playlist of a user contain vital information on the similarity between artists or albums or tracks that can easily be automatically extracted. Thus, by adding tracks together sequentially as playlists, users actually creates a relation between the tracks that was not there before. Such a relation can be whatever the user want it to be: that the tracks or artists/albums are similar in style and/or genre; that they share the same sound, key or mood; that they are related in when or where the music was created; it could be distant or very close relations between participating artists; or that the user simply just feel that they are somehow connected to each other in a way that by some reason makes sense for this or that playlist.

By tracking this information only, the position of track-IDs in the users playlists, we are able to 1) track the musical taste of an individual user, and 2) weight these relations to each other according to a limited set of principles and similarity measurements, in order to come up with a large set of appropriate recommendations based on a small query set of input data. Otherwise expressed: by a very limited set of information, which easily can be processed by computers, and without having any explicit knowledge on the item itself, a large set of functions can be developed.

Yet another set of independent recommendations are presented in the detailed track info window, the this track is: commonly followed by; commonly preceded by; commonly seen together with. It displays other users that have this track represented in one of their playlists as well, and it displays what songs precedes, follows and are most commonly present together with this track in other users playlists. These are also recommendations on the track level, which are presented in the track-detail window.

In the tracking of an individual users musical taste, is also the users rating of his/her own and other users playlists, artists, genres and tracks considered, as well as the musical profile (if that such a profile is voluntarily provided by the user).

[1] patent pending

Figure 3. Tracks suggestions for a selected track.

By tracking user behavior on the website, as briefly described above, MusicStrands^{TM}are able to automatically detect trends among the user community. Based on advanced statistical learning techniques, MusicStrands^{TM}offers yet another product for making forecasting reports on changes in consumer tastes: The MusicStrands Emergent Hits^{TM}.

5. MYSTRANDS^{TM}

Our concern according to the search and browse-functions that we offer have also been the different ways in which a user behave when looking for digital music in different kind of situations. The behavior are not at all the same.

1. When you as a user know what item you want, it should be accessible to you as easy as possible, and the items displayed should be as few and as accurate as possible. It is at the present possible to very efficiently find the music you are looking for by typing keywords in our search, using both traditional keywords and such less conventional: such as dinner for example. However, accuracy and efficiency is not always the best way to present music.

2. Humans also tend to discover things while not immediately finding what they search for, but something similar on the way. This behavior is browsing; like walking around, quite painlessly, exploring what a record store has to offer. Here You want to have many things displayed in contrast to when you are looking for a specific object only.

MusicStrands^{TM}offers several different opportunities to find and discover music by browsing either for: playlists; artists; albums; or by genre. Navigating the universe of musics (the artists, and their albums and tracks) might

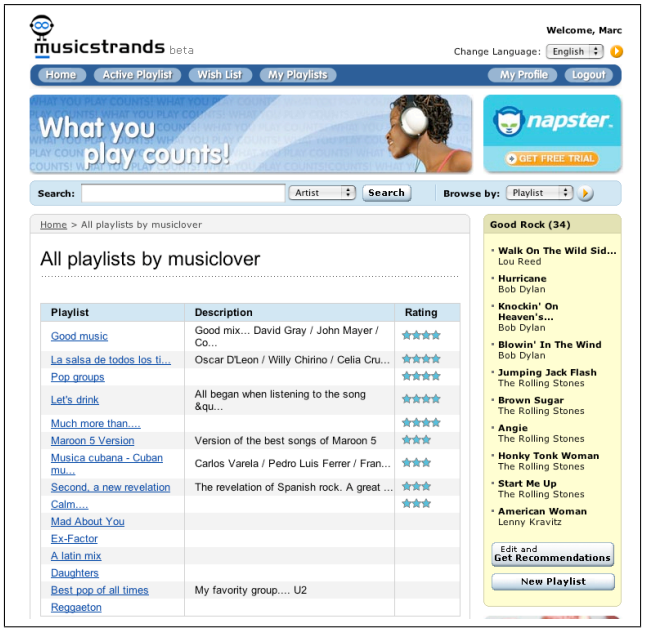

Figure 4. My Playlists.

be regarded as a journey of discovery. There are many ways of raising an interested in a non-familiar music. The best way to find out if you like a music or not is simply by listening to it. This you can do at every instant of the MusicStrands^{TM}website (although by reasons of copyright only clips of 30 seconds up to 1 minute are provided for free at the present).

Another way is by getting to know more about the genre, sub-genre; artist; album or song. When finding an artist which You find interesting, you simply click on the artist-name and you will be presented with the opportunity to either read more about the artist/group (artist biographies); all the albums of a certain artist will be presented ordered by year of release, and together with a picture of the original album cover; you will be presented with links to related projects (like solo-projects or other bands where the same artist was also a member); and you will be presented with related artists, such as direct links to those artists that has influenced the artist you choose; the followers of that artists; as well as contemporary artists that are now popular within that genre or subgenre. When browsing by genre, You will be able to read about the different genres and subgenres, see and listen to example playlists containing the key figures (and links to) of this or that genre/subgenre, etc.

This way, by determining only one point of arrival you can easily be carried away on a journey of related musics, groups and musicians, backwards and forwards through the history of music, at the same time as your active playlist is constantly present and your entire archive of playlists are no more than just one click away. At every moment, whenever you find something you like you can add it to your own music library on the MusicStrands^{TM}website.

By offering our users the possibility to successfully upload their entire music archives, such as stored in their

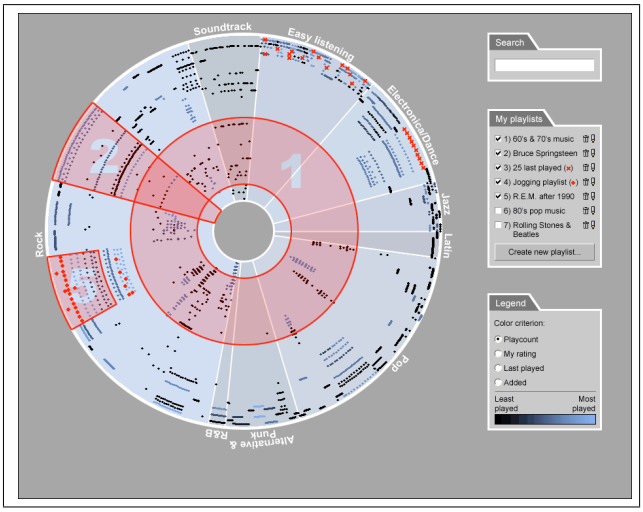

Figure 5. Disc visualization of a music personal library.

computer or iPod, MusicStrands^{TM}offers their users to be their personal Online Music Library, accessible from wherever they are (provided only internet access). However, the development of mobile players (such as the iPod) with rapidly increasing memory capacity has shown the emerging difficulty of having an topologic overview over just your own music library, nowadays easily containing thousands of tracks. Therefore MusicStrands^{TM}has developed tools for graphical visualization of their personal music libraries which allows users to better overview the content and ease the organization. The goal of these visualization tools is two-fold: 1) to give an overview of the entire content of a large music library, and 2) to visualize playlists and to offer supporting tools to manage and organize them.

6. REFERENCES

[1] Marc Torrens, Patrick Hertzog and Josep-Lluis Arcos. "Visualizing Personal Music Libraries', *Proceedings of the 5 International Conference on Music Information Retrieval*, Barcelona, Catalonia, Spain, 2004.