PlaylistCreator: An Assisted Approach for Playlist Creation

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ABSTRACT

In this demo paper we describe PlaylistCreator, an assisted approach for supporting the creation of music playlists. Our solution allows creators to express song selection and browsing through a visual representation of their intents in a unified view, which relies on a set-based model for representing sources of songs. Creators can convey their purposes by seamlessly combining criteria for song selection from either manual or automatic sources, such as artists and albums, or similarity measures between artists or songs.

CCS Concepts

•Human-centered computing → Graphical user interfaces; •Information systems → *Search interfaces;*

Keywords

Assisted Playlist Creation; Song Selection; Set Theory; Visual Representation

1. INTRODUCTION

During the last years, music playlists have received increasingly attention from researchers because of their use in streaming services as a mechanism to promote song discovery, and as a strategy for browsing music libraries, and for social affirmation. Most recent efforts in the research of playlist creation have been directed at the creation of algorithms to automatically generate playlists without human control and intervention [1]. However, assisted techniques that rely on visualization techniques for supporting a hybrid playlist creation have gained attention, mostly driven by recent findings from a few studies reporting that people enjoy creating playlists manually [3], and that listeners trust and prefer handmade playlists over those automatically generated [5]. Assisted techniques promise to bridge the gap between manual and automatic approaches and address the lack of control existent in automatic techniques.

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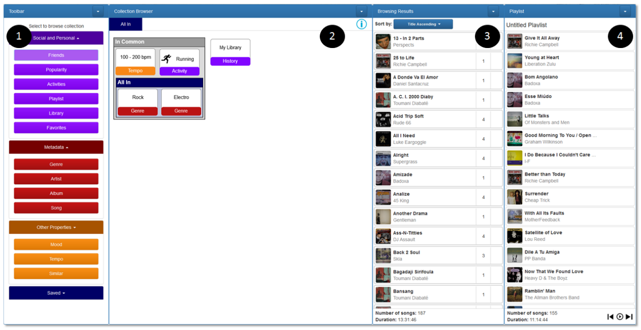


Sort by: Title Ascending

13 - In 2 Parts
Perspects

25 to Life
Richie Campbell
1

A Donde Va El Amor
Daniel Santacruz
1

A. C. I. 2000 Diaby
Toumani Diabaté
1

Acid Trip Soft
Rude 66
4

All I Need
Luke Eargoggle
4

Alright
Supergrass
4

Amizade
Badoxa
1

Analize
45 King
4

Another Drama
Gentleman
1

Ass-N-Titties
DJ Assault
4

Back 2 Soul
Skla
3

Bagadaji Sirifoula
Toumani Diabaté
1

Bansang
Toumani Diabaté
1

Number of songs: 187
Duration: 13:31:46

Untitled Playlist

Give It All Away
Richie Campbell

Young at Heart
Liberation Zulu

Bom Angolano
Badoxa

Esse Miúdo
Badoxa

Little Talks
Of Monsters and Men

Good Morning To You / Open ...
Graham Wilkinson

I Do Because I Couldn't Care ...
I-F

Better than Today
Richie Campbell

Surrender
Cheap Trick

With All Its Faults
MotherFeedback

Satellite of Love
Lou Reed

Dile A Tu Amiga
PP Banda

Now That We Found Love
Heavy D & The Boyz

Ramblin' Man
The Allman Brothers Band

Number of songs: 155
Duration: 11:14:44

Figure 1: PlaylistCreator User Interface.

In this paper we present PlaylistCreator[1], an assisted approach for supporting the interactive creation of playlists. This solution allows creators to perform song selection by seamlessly combining heterogeneous criteria, either from manual and automatic sources (Figure 1), in a composite box-like visual representation, similar to faceted techniques. It combines strategies for manual song selection, like for example, looking for songs using metadata (song title, artist name, and album name), with algorithms that automatically suggest songs, based on content-based features, for instance. This application implements a set-based model that provides the background for the design of complex queries through the combination of heterogeneous sources of songs with the recourse to binary operations from set theory [4].

2. SONG SELECTION

Assisted approaches typically rely on visualization techniques to support playlist creation. In PlaylistCreator, we propose a set-based model and a composite box-like visualization to support song selection for creating playlists.

2.1 Set-based Model

In our model, every *source of songs (or entry point)* is considered a *set*. Songs can belong to one or more sets, and a set can have zero or more songs. The sets of songs can either come from a manual source, like the songs from an artist or an album, or from an automatic approach, such as the tempo, mood or similarity. Some sets can be a subset of others, and the result of combining them depends on the criteria used to create (filter) them.

To support the creation of more complex queries, sets can

[1] http://web.ist.utl.pt/ricardo.dias/playlistcreator

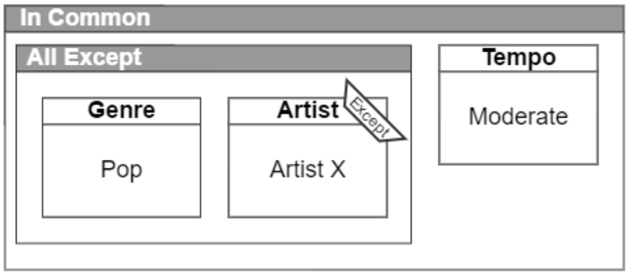


Figure 2: Visual representation of a query, with three sources of songs and the application of the set binary operations.

be combined using the binary operations from set theory [4]. To improve readability, speak the users language and facilitate recognition of the different operations, we defined a nomenclature closely related to song selection for each of the set operators: i) Union - **All In**, ii) Intersection - **In Common**, iii) Symmetric Difference - **Not In Common**, and iv) Set Difference - **All Except**. Despite their provenance, either manual selection or automatic algorithms, all sources are treated and represented equally.

2.2 Visual Representation

To represent the proposed set-based model we adopted a composite box-like diagram, in a similar fashion to what is presented in *UML diagrams* or in some faceted techniques [2]. We chose this representation because it provides an easy to read visualization, and supports the combination of different criteria in more complex queries by applying box composition (for manual and automatic sources).

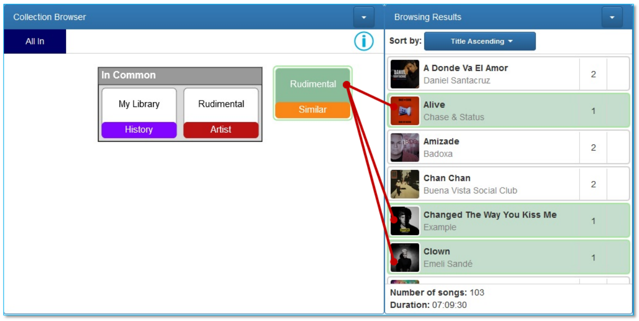
Each *source* or set is drawn as a *box*, in a similar fashion to *Classes* in *UML diagrams*. This representation provides a visual mapping of the *source*, by showing the type that it represents and a description or parametrization of the source (Figure 2 - Genre, Artist and Tempo). Set operations are also drawn using a box representation that encodes the *type of the operation and its parameters* (Figure 2 - In Common and All Except). We applied box composition in a similar fashion to *object composition* in *UML diagrams*, to capture the essence of the operations and improve query readability.

3. PLAYLISTCREATOR PROTOTYPE

PlaylistCreator is the prototype developed for supporting an assisted playlist creation (Figure 1), using the proposed set-based model to allow the combination of both manual and automatic criteria for browsing and song selection. It was implemented using the Play Framework for the backend, and HTML, CSS, Javascript, and GO.JS[2] for the front-end. Communication is handled using JSON requests.

3.1 User Interface

The user interface of PlaylistCreator is divided into four main parts as depicted in Figure 1: 1) consists of a toolbar representation that allows creators to select songs from a list of predefined filters or criteria grouped into different categories, and that encode the sources of songs described in the set-based model; 2) the *Collection Browser*, depicted in area 2, is where creators combine the sources of songs to browse the music collection and select songs, using the visual representation proposed; 3) consists of a sortable list of songs that contains the result of the visual query created, and highlights the relationship between the sources of songs used in the *Collection Browser* and the results (bidirectional brushing and highlighting mechanism); 4) represents the playlist being created, offering the possibility to add, remove, reorder and position songs, as well as exporting the playlist.



A Donde Va El Amor Daniel Santacruz	2
Alive Chase & Status	1
Amizade Badoxa	2
Chan Chan Buena Vista Social Club	2
Changed The Way You Kiss Me Example	1
Clown Emeli Sandé	1

Number of songs: 103
Duration: 07:09:30

Figure 3: Brushing and Highlighting mechanisms.

3.2 Song Selection and Playlist Creation

In PlaylistCreator, each playlist is created and managed manually, with creators having the final decision about which songs appear in it. To select songs from the music collection, creators drag the sources of songs from the *toolbar* to the *collection browser*, and compose them using the available operations. This creates visual queries like the ones depicted in Figure 2 and 3 and filters out songs that respect all the criteria (Figure 1-3). The combination of results follows a bottom-up approach, by first selecting the songs for the sources (Figure 1- Genre, Artist, Tempo) and then performing the binary combination operations (Figure 1 - All Except, In Common). Each song is related to a list of the sets that originally selected it, which supports the brushing and highlighting mechanisms (Figure 3), that promote transparency of the combination process and trust in the final results. In this approach, the higher the number of sources that suggest a song, the more probable that song fits the intents of the creator entirely. Finally, creators pick the songs they want for the playlist, either by randomly or individually selecting them.

4. CONCLUSIONS

PlaylistCreator is an assisted approach for playlist creation that proposes the use of a flexible and scalable set-based model and its visual representation to seamlessly support the heterogeneous combination of music sources for the task of song selection.

5. ACKNOWLEDGMENTS

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[2] https://gojs.net/

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