

# Report

## Case#1\_Urørt

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# Introduction

## Background

Whenever you try to explore new music, the question of how you navigate through the different artists and tracks and find either what you are looking for or discover new interesting music, presents itself. The field of information visualization is vast. There are solutions for nearly everything. From list based to 3dimensional representations, from static information display to animated navigational tools, from predefined to user generated.

We have focused on these questions of navigation and exploration, as well as how Urørt may enhance the sociability of their site. Today, Urørt is a content driven social site. Like Flickr and YouTube, Urørt is basing the social interaction around specific objects (i.e. photographs, videos and music).

## Problem definition

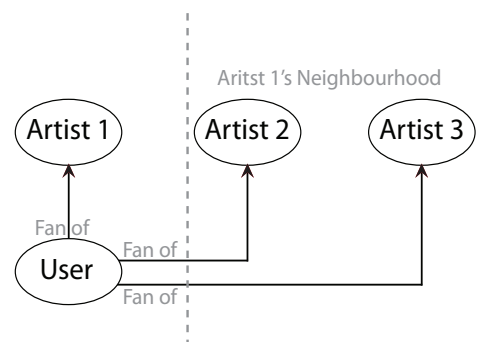
How to discover new Urørt-music from a desktop based player?

Music has no semantic information in its self. This makes it very difficult to search for something specific other than descriptive words and artist name/title.

Urørt keeps lists over the songs most downloaded and the most listened to, sorted by the last year, the last month and the last week, as well as genres. The problem with these lists is that they cement the popular artists as being popular. When you first enter the list you'll be much more accessible than the others leading to more listening of you, and thereby preventing other artists not on the lists from being heard. Nevertheless, the lists do give a quick presentation of what music exists on Urørt. This problem also occurs when searching for genres. If you for instance choose the genre "Rock", you will get close to 11000 results. These results are displayed 8 at a time ordered with most popular first. You then have to click page by page to search the results. There is no way to jump to, for instance, page 600 (out of 1300 pages). This is characteristic to urørt and further cements the popular as popular.

Urørt attempts to remedy this "problem" with what they call the neighbourhood (Nabolaget). The neighbourhood is built up by showing you other artists that your fans also are fans of. This means that you can start out with a band that you know, and work your way through bands that your fellow fans also like.

Urørt has in their databases a massive amount of information that would benefit the users if made more accessible. We've therefore decided to work with visualizing and exploration of data (read music). To open up for different visualization solutions we've chosen to look at desktop applications; this should



enable the use of hardware, such as graphics card, to improve the graphics performance as well as the overall performance of the application.

## State-of-the-art / research

### Classification and Sorting

To start off the project we looked at different ways of classifying and sorting music. Prominent services like LastFM and Pandora have different ways of going about it.

LastFM states: “The list of artists which you may see on an artist page as being “similar” is based exactly on our user’s listening habits. If a lot of users listen to Artist X, but also Artist Y and Z - Y and Z artists will become similar to X.”<sup>1</sup>

While Pandora goes about it in a totally different way: “...we set out to capture the essence of music at the most fundamental level. We ended up assembling literally hundreds of musical attributes or “genes” into a very large Music Genome. Taken together these genes capture the unique and magical musical identity of a song - everything from melody, harmony and rhythm, to instrumentation, orchestration, arrangement, lyrics, and of course the rich world of singing and vocal harmony. It’s not about what a band looks like, or what genre they supposedly belong to, or about who buys their records - it’s about what each individual song sounds like”.<sup>2</sup>

Using both Pandora and LastFM gives really good listening results. Both give relevant music based on your listening history and choice of genre, although, based on experience, Pandora tends to present more unknown music. Pandora can also sometimes drift off and away from where you started listening. Since Pandora uses the musical genomes, listening to a “radio channel” that you create can also be a bit exhausting, since the musical sound is so similar all the time. With LastFM, you tend to get music sounding more different from song to song.

Several articles have been written on emotional classification of music. Micheline Lesaffre and others list several semantic descriptors in their article “How Potential Users of Music Search and Retrieval Systems Describe the Semantic Quality of Music”.<sup>3</sup>

TABLE 1. Model for semantic description of music used in the annotation experiment.

Semantic Descriptors				
Affective/Emotive		Structural		Kinaesthetic
<b>Appraisal</b>	Cheerful	<b>Sonic</b>	Soft/hard	Gesture
	Sad		Clear/dull	Melody imitation
	Carefree		Rough/harmonious	Memory
	Anxious		Void/compact	
	Tender		Slow/quick	No recognition
	Aggressive		Flowing/stuttering	Style recognition
	Passionate		Dynamic/static	Vaguely known
Restrained		Well known		
<b>Interest</b>	Annoying	<b>Pattern</b>	Timbre	Judgement
	Pleasant		Rhythm	Beautiful/awful
	Touching		Melody	Difficult/easy
	Indifferent		None	

1 <<http://www.last.fm/help/faq>>, [17.10.2008]

2 <<http://www.pandora.com/mgp.shtml>>, [17.10.2008]

3 Micheline Lesaffre and others, *How Potential Users of Music Search and Retrieval Systems Describe the Semantic Quality of Music*, Wiley InterScience, Journal of the American Society for Information Science and Technology 59(5):695–707, 2008, <<http://www3.interscience.wiley.com/cgi-bin/fulltext/117908461/PDFSTART>>, [17.10.2008]



In the article “Extracting Emotions from Music Data” Alicja Wiczorkowska and others show results from research where they try out different computer algorithms to find musical emotions from sound.<sup>4</sup> They have devised a set of algorithms that all work in different manners and explore various musical pieces to try to determine the emotional theme of the piece. As a set of labels for musical emotions, they grouped emotions in eight groups to ease the classification of sound. Musical emotions are subjective things and one person might even interpret the same musical piece differently from a day to another. This study shows how difficult it is to simplify and categorize musical data by use of computer algorithms and without any human interference.



## Visualization, Navigation and Software Layout

We’ve looked at a few different software and visualization solutions. Worth noting are Fidge’t, Winamp 2.80 and hyperbolic tree navigation.

### Fidge’t

“With the Fidge’t Visualizer, you can get a Heads-Up view of your networks tagging habits. See what kind of music your network is into, or what kind of pictures they are taking. From the visualizer you can also explore recent music and pictures, (...) done from a (...) desktop application.”<sup>5</sup>

### Winamp

In the early days of computer played mp3 music, Winamp was the main choice for a majority of users around the world. The reason was the fact that it was freeware, but also its lightweight design and small impact on machine resources. Winamp was from the beginning module based. That meant that the player had expandable windows and gave the user the ability to hide and show the functions needed for a specific task. For instance you could hide the playlist or mixer, and even move them around on your screen as you would see fit. Screen resolutions were also scarce, so the small player would often be used on top of normal programs while working with other things.<sup>6</sup>

4 Alicja Wiczorkowska and others, *Extracting Emotions from Music Data*, National Science Foundation, Automatic Indexing of Audio Research Program, <[http://www.mir.uncc.edu/docs/papers/02\\_Extracting%20Emotions.pdf](http://www.mir.uncc.edu/docs/papers/02_Extracting%20Emotions.pdf)>, [17.10.2008]

5 <<http://fdgt.com/>>, [17.10.2008]

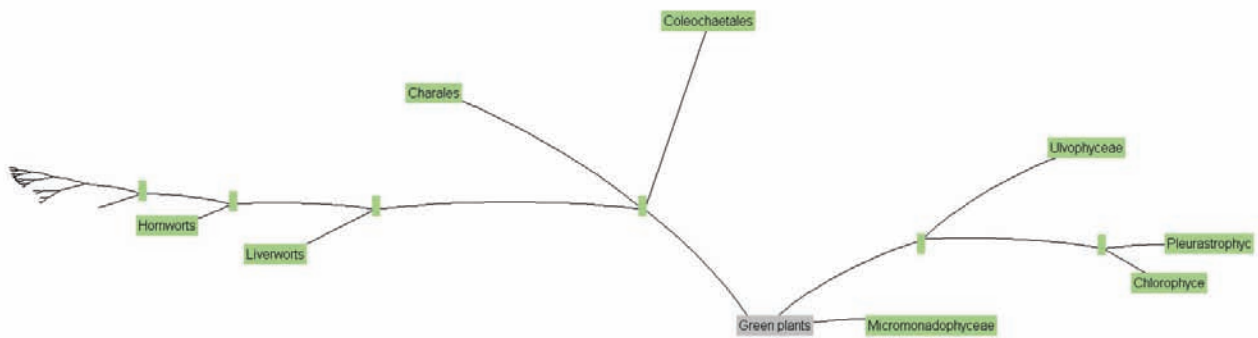
6 (<<http://altus.ifrance.com/img/mexp.png>>, [17.10.2008])



From version 3, this all changed. The program lost its module based layout and became resource heavy, which for a lot of people brought the Winamp era to an end. But the player still has many users worldwide.<sup>7</sup>

### Hyperbolic tree navigation

Hyperbolic tree navigation has been around since the mid 1990's.<sup>8</sup> It was originally developed and patented at the Xerox Palo Alto Research Centre, but you can find different Java and JavaScript versions on the web.<sup>9</sup> The visual representation of data that this logarithm produces gives a clear overview of large quantities of information and always let's you know where in the network you are at any given time.



7 <<http://www.winamp.com/>>, [17.10.2008]

8 John Lamping, Ramana Rao, and Peter Pirolli, *A Focus+Context Technique Based on Hyperbolic Geometry for Visualizing Large Hierarchies*, CiteSeerX, <<http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.20.1530>>, [17.10.2008]

9 <<http://ucjeps.berkeley.edu/map2.html>>, [17.10.2008]

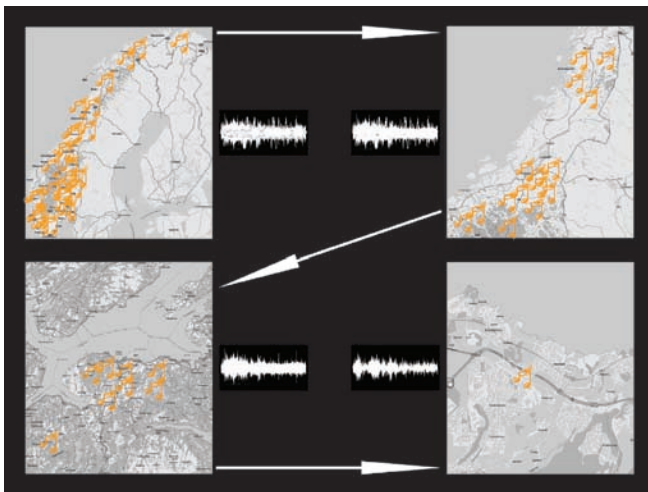


# Process & Methods

## Part 1: Discovery

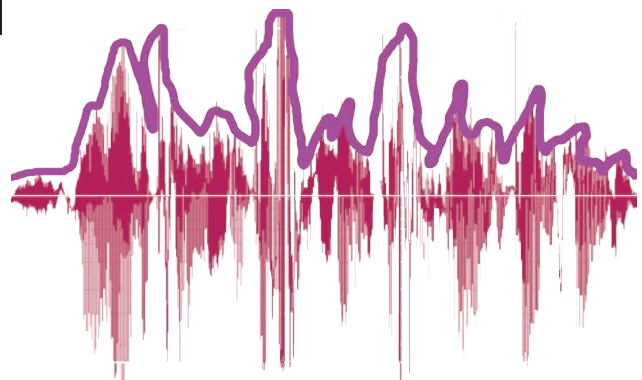
We started off by experimenting with alternative ways of discovering new music.

The following are two concepts we came up with:



We pictured an interactive map with music being streamed from whichever geotagged artists present at any time. In other words, as an artist you would be tagged to your specific location (e.g. your home address) and when browsing the map, any artists that were tagged within the active screen would be played at the same time, creating a cloud of music where you could sort the music by zooming in and choose specific areas and thereby isolate the tracks.

This is another alternative discovery method where the idea was to give the user an opportunity to “draw” their music. By drawing a line, the program would try to match it to a song by way of amplitude visualized as waveform.



As we learned by Alicja Wiczorkowska and others above and how LastFM and Pandora solve their grouping and categorization, using computers to scan and analyze music is in its infancy and not suitable. Pandora and LastFM utilize huge groups of people to make their system work.

How is Urørt supposed to do this? What can Urørt expect of their users to help and better the search, navigation and discovery of new music at Urørt?

These are the questions that we hoped to get answered with the help of Living Lab.

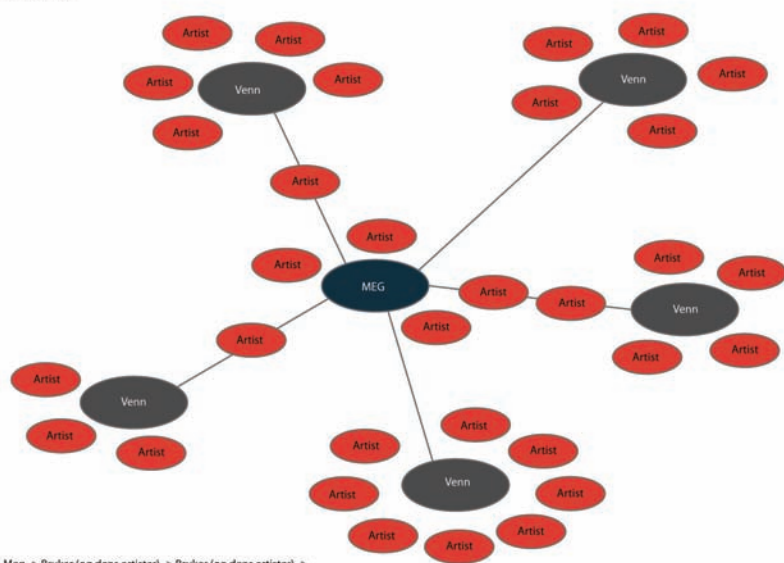
We devised a set of questions aimed at users of Urørt that put music to the site (i.e. band/artists) to find out in what degree they tagged their music to try and give it semantic meaning. And if they would use tagging more if they were encouraged by the system to add tags and emotions to the songs.



Unfortunately, we haven't got any results back from Living Lab. So we had to make a conclusion by ourselves to the questionnaire: We experience that music generally has very little tagging information. This could be caused by lack of information to the artist explaining that more is better. If you only have tagged a song with rock, surely no one is going to find you. It's almost a guarantee, because you will be at the end of every list there is. So we have built the concept further based on an Urørt world where tagging with both free text tags and predefined emotions is wide spread.

With inspiration from the hyperbolic tree we cooked together a node based navigational discovery tool.

Venner listing

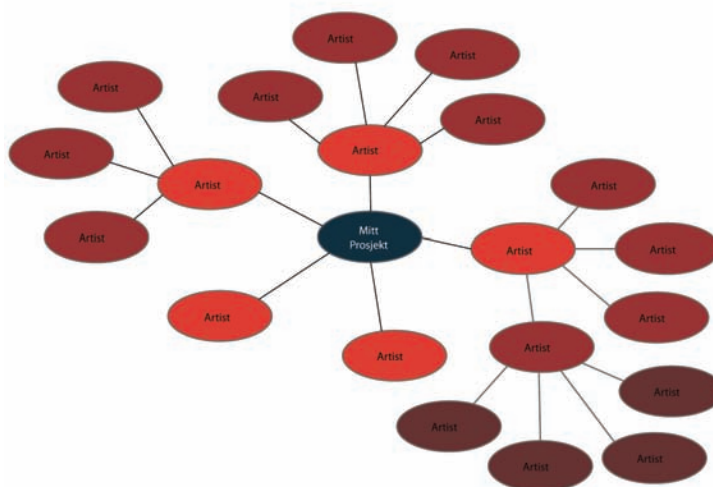


Meg -> Bruker (og dens artister) -> Bruker (og dens artister) -> ...

This first one is based on the new feature Friends (more on this under Discussion). The idea is that you can discover new music by browsing through your friends and their favourites, and then in extension their friends and their favourites, using people as the link, not the music. This could by some be seen as a means of quality checking, since most friends also share some of the same musical taste. At the same time it would open up for the possibility of discovering new interesting music, since the link is people's musical taste and not similar music.

This one is based entirely on browsing music through similar artists. It is based on the neighbourhood (as described under the Introduction). The idea here is that if you would like to discover music that is similar to an artist the best way is to look through other artists that most of the other people who like the first artist also likes. The main problem here is the sheer amount of information that builds up, and how to present it in a meaningful way.

Nabolag listing



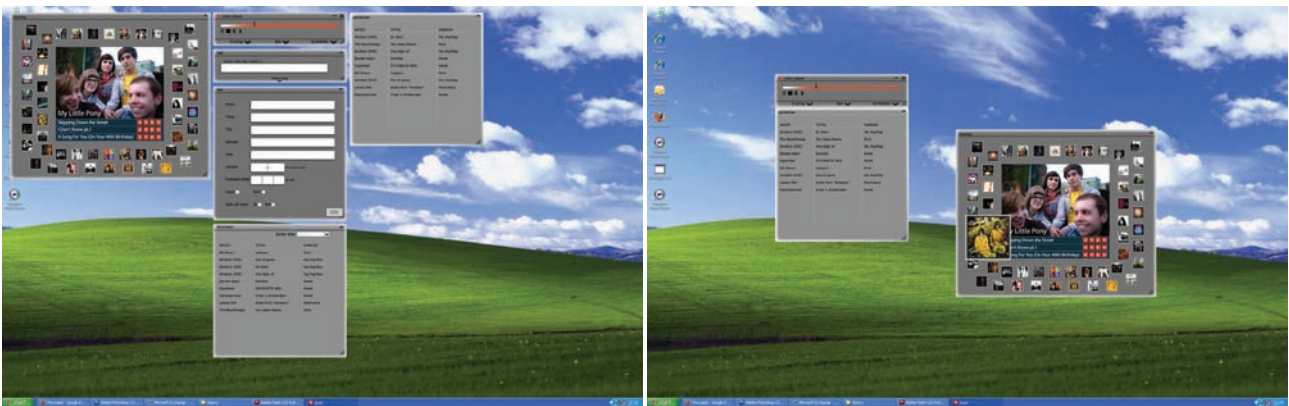
Mitt Prosjekt -> Mine fans andre favoritter -> Deres fans andre favoritter -> ...



## Part 2: Modularity

After working with discovery and visualization we found the time was right to get practical about it and started constructing the player. With an eye towards the old Winamp 2.8 we started building a modular based application. At first we started exploring the different functions by means of paper prototyping.

We then started building a clickable prototype in Adobe Flash, to easier get the feel of the modularity and its functionality.



As you can see here, the player was built up by the player window, a search and an extended search window, results, playlist and visualization/navigation windows.

At about this time we took two steps back and tried to have a new look at the player. Our problem definition was “How to discover new Urørt-music from a desktop based player?”, and our result so far did not meet the problem in a satisfactory way. The player in itself was just another player with standard search options, the visual browsing was none too accommodating for discovery of new music.



## Part 3: Visual Focus

We started off with a blank whiteboard but with a better understanding of the task and the road ahead. Through brainstorming we landed on the concept of a one window based application where the player and the visual representation of songs and artist could seamlessly merge and interact. Working mainly with the visualization of data and how this could ease discovery of new music as well as finding specific information, we started making Adobe Photoshop sketches.



The sketches shown here describe the road from experimenting with masses of information (10 000 dots), through visual style sketches to something resembling the final result.

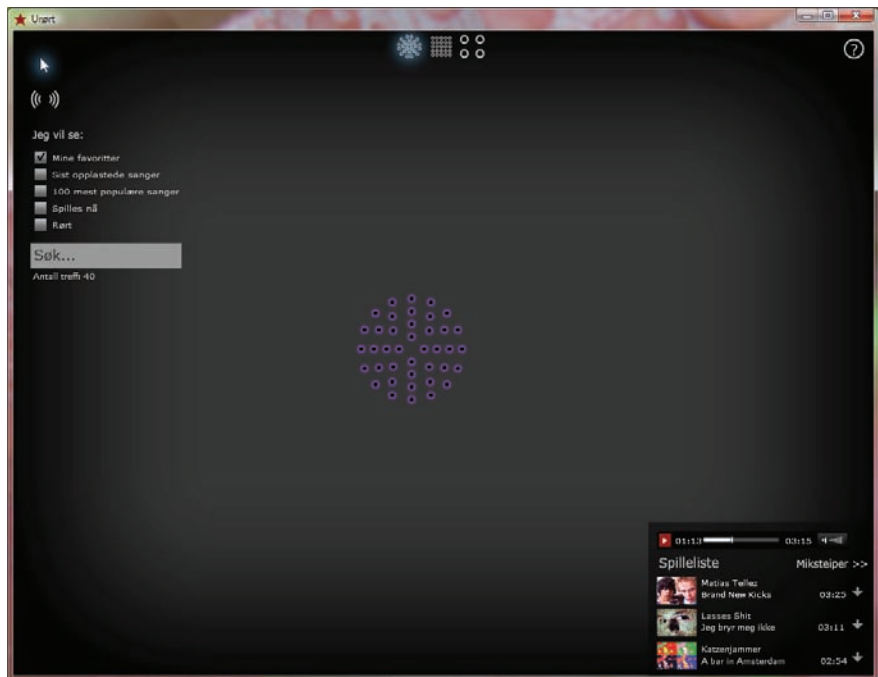
We decided to quite quickly start making clickable flash prototypes while at the same time working graphically in Photoshop. We also tried out Adobe Air as a publishing tool (more on this under Discussion).



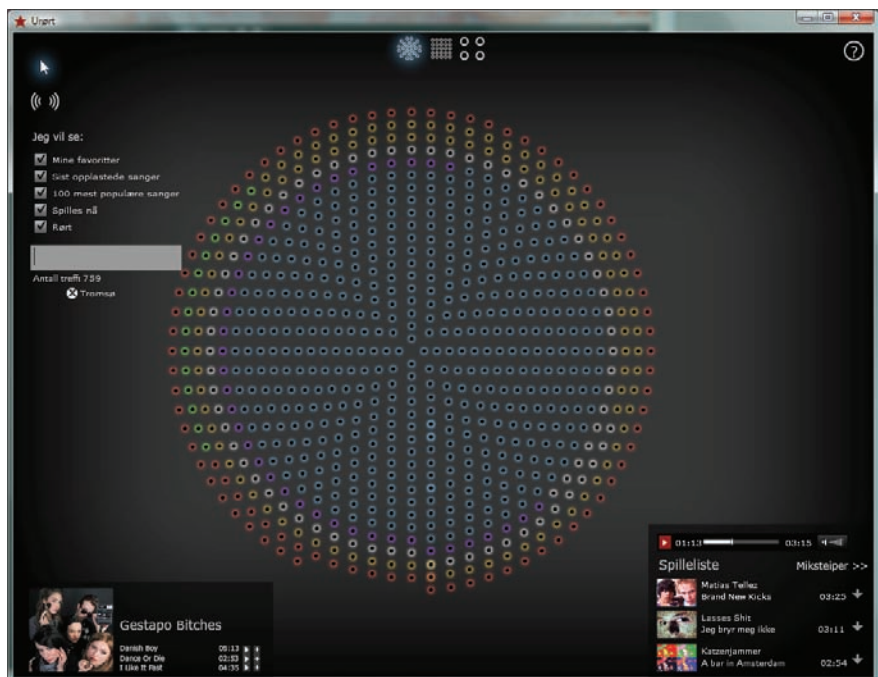
# Results

This is the default opening window, with your favourites displayed in a circular centric view mode. Your last active playlist is listed in the bottom right corner.

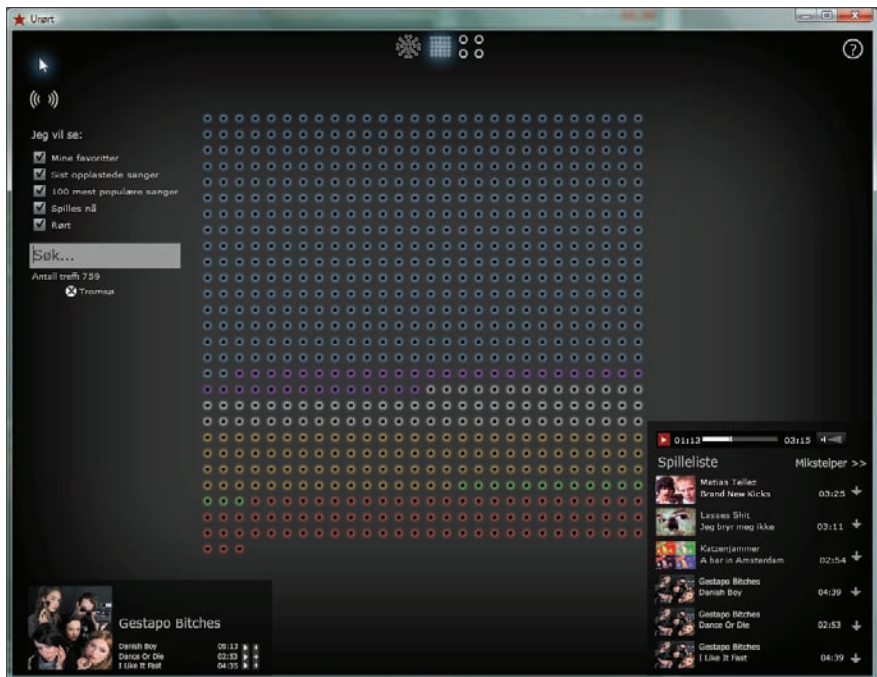
On the left side all the different tools are listed; navigation tool, listening tool, the different groups, and the search bar. On the top you have the different view modes, as well as the help button in the upper right corner.



Here all group options have been selected: My favourites, the newest uploads, the 100 most popular songs, active songs (being listened to by other users), "touched" artists (artist who've got a record contract). In addition the area with blue dots is search results. A song has been clicked on and information about the artist is displayed in the bottom left corner.

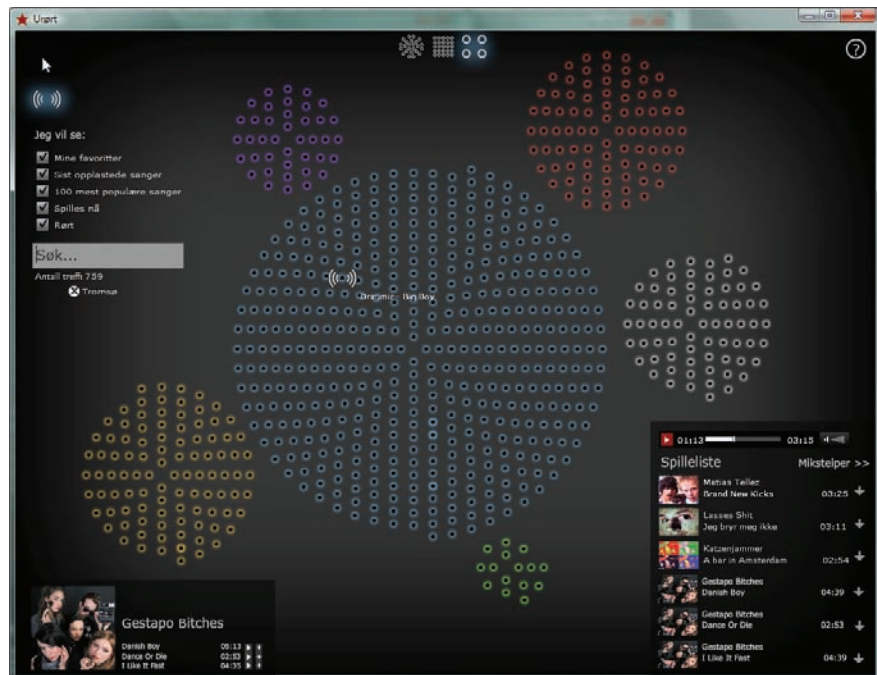


The same hits are displayed here, but now in a linear view mode. You can see that the playlist has expanded with the three songs of the artist in the bottom left corner. This was done by clicking the +’s to right of the songs. You can also add songs to the playlist by dragging them from the centre, or by clicking on them directly with the listening tool.



The listening tool (now active) is a tool for easy discovery of music. When moving your mouse over the dots, excerpts of the songs start playing. With this tool you can listen to as many songs as you like with no clicking whatsoever. A single click sends them on to the playlist.

You can also see the last view mode active here, the group view mode. This organizes the different groups in their own areas, for easier control of your discovery process.



# Discussion

In conclusion we would like to go through a few of our reflections about things we've touched on during the project.

## Semantic information

Little or next to no inherent information resides in recorded music. This limits searches for music to things such as length in time and amplitude, things which can easily be read by software and is totally uninteresting for most users.<sup>10</sup>

The usual practice is to add a title, artist name and a genre tag, as well as perhaps location based tags. Though this helps a long way, we find that it is not nearly enough to make the act of searching for new music worthwhile. When looking for new music, the artist name and song title means nothing to you; and by leaning on genre descriptors you limit your findings in a far too narrow manner.

We believe that there should be added more information to music. Since Urørt is a small division within NRK, with more than enough on their plates already, we will suggest a focus on influencing the users to add more information when uploading new songs. This could be done by adding checkboxes with descriptors (such as emotional tags or musical attributes) and barring uploads until at least, say, five boxes are checked. Or there could be a text field with the header "Please describe you music to make it easier to find for other people" for filling in and then a script could convert different descriptors (for instance adjectives, adverbs and nouns) to searchable tags.

## Experiences with Adobe Air and Flash

The Urørt-staff suggested Adobe AIR as a platform for creation and distribution of the application. AIR is a runtime environment that utilizes web technology and combines it to form an application that is installable and cross platform compatible. Since the web application now is run as an application on the desktop, programmers can utilize machine and operating system functions for storing and loading local files, use hardware acceleration and more.

However, the clickable version of the module based music player that we tried out early in the project presented us with a proof of some limitations. Since the player was supposed to be used without the normal application frame, the Flash itself had to be made full screen. This degraded performance in Flash and tween animations were not smooth. We knew that should this player function well with huge amounts of search results displayed as animated objects, flash and AIR was not yet capable of doing this

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<sup>10</sup> Tim Pohle, Elias Pampalk and Gerhard Widmer, *Evaluation of Frequently Used Audio features for Classification of Music into Perceptual Categories*, Department of Computational Perception, <[http://www.cp.jku.at/research/papers/Pohle\\_CBMI\\_2005.pdf](http://www.cp.jku.at/research/papers/Pohle_CBMI_2005.pdf)>, [17.10.2008]



full screen. The computations that Flash did cost too much. The later version is, with regards to animations, much heavier. But it runs smoothly even with thousands of displayed animated objects.

As a footnote, we might just add that MS Silverlight now comes with .NET-compatibility in version 2.0. Silverlight is also cross platform and is made from scratch as a fully object oriented alternative to Flash.

## New Feature – Friends

We believe that Urørt would benefit from adding a friends feature to their site. At the moment all the personal connections on Urørt are strictly one way; you are a fan of someone, or you can leave them a message in their guestbook. There's no way of choosing who you're connected to. The mix tapes function isn't working too well either. The traditional idea of a mix tape is to compile music for your own listening, or give it to others for them to experience new music compiled by you; often with a sense of purpose. The way it gets used on Urørt at the moment is mainly a way of listing your own songs and getting them on the front page latest mix tapes list. The mix tapes work as a means to save music for own listening, but not as a socializing tool.

By introducing a friends feature where both parties have to approve the connection, networks of people wanting to socialize around music can appear. This would make the mix tapes a viable option for sharing and recommending music; private communication like messages and message lists, in addition to the original guestbook, would make Urørt a place to hang out and keep in touch, both with old friends and new. This would attract more users, and more users would result in more music.

