



# Spotify and Digital Methods

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# Songblocker

More than just a blocker

<https://www.youtube.com/watch?v=BviZnSYNPL0>

## Songblocker

During the 30th **Transmediale festival** for art and digital culture in Berlin in February 2017 a new application was launched: Songblocker.

In line with classic tech startup jargon, the app was introduced as a “groundbreaking application” that would “revolutionize the way people listen to and enjoy ads.”

Functioning as a Microsoft Windows and Mac OS X plugin, the allure of Songblocker was **its ability to automatically mute songs on Spotify**—and instead allow its users to enjoy “**100% awesome ads**”.

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# Songblocker

DOWNLOAD NOW

>

<https://www.songblocker.com/>



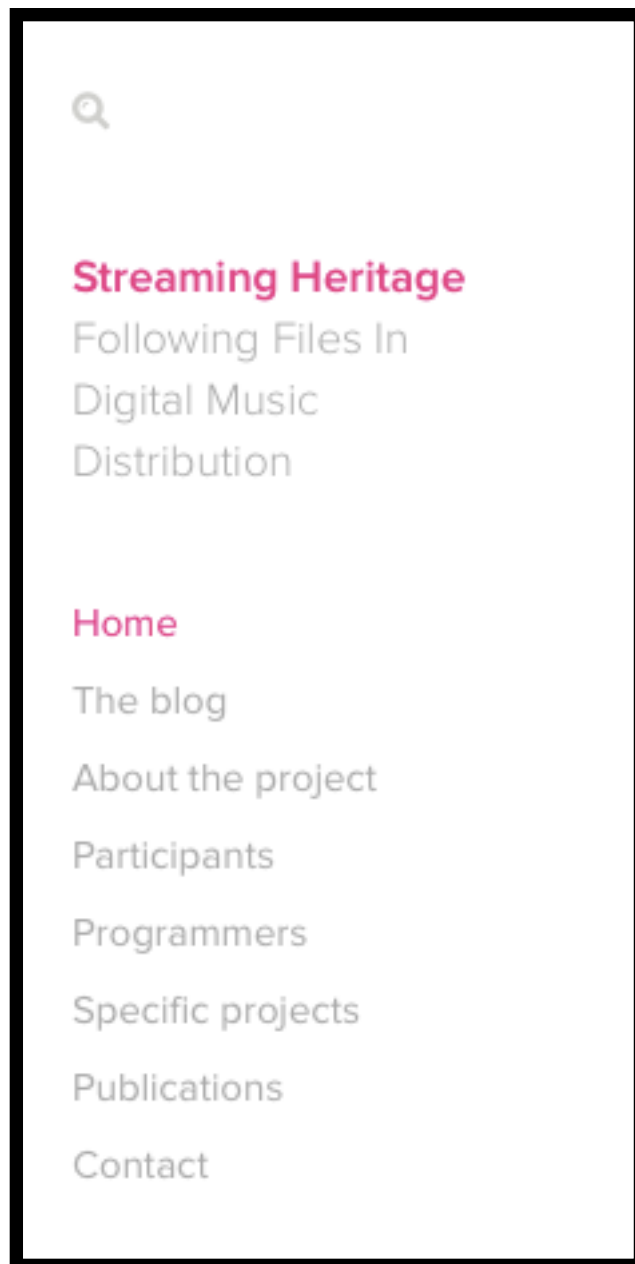


## Songblocker

As most of you might suspect—Songblocker was **nothing but a hoax**. It was a fictitious startup, designed by a number of researchers with the aim to intervene, discuss—and problematize—some of the moral imperatives that have begun to emerge around online content and its monetization by ads.

The plenty amounts of views on YouTube were also fake, obtained by us researchers through **buying fake likes** and views from specially selected click-farms in Indonesia.

However, the Songblocker plugin is **downloadable**, fully functional and available at [songblocker.com](http://songblocker.com).



<http://streamingheritage.se>

## Songblocker

Within our research project we considered the **Songblocker intervention** as an ethnographic speculation—or more precisely, a “**technographic**” speculation.

The aim of the experiment was not to generate results. Rather, we wanted to engage in the kinds of **speculative methods** that have been proposed by Luciana Parisi, Nina Wakeford, Celia Lury and others.

Such **methods privilege imagination, narrational mutations and adventurous methodological journeys** on the path towards exploring digital technologies as well as triggering discussions.

CULTURE, ECONOMY AND THE SOCIAL

# Inventive Methods

The happening of the social

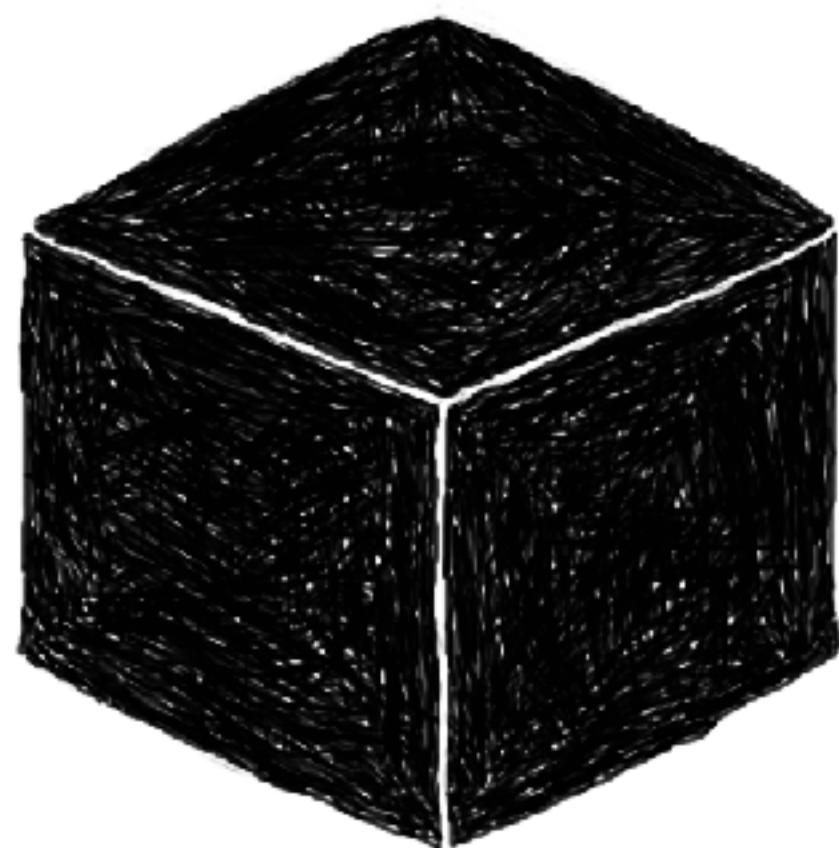
Edited by  
Celia Lury and Nina Wakeford

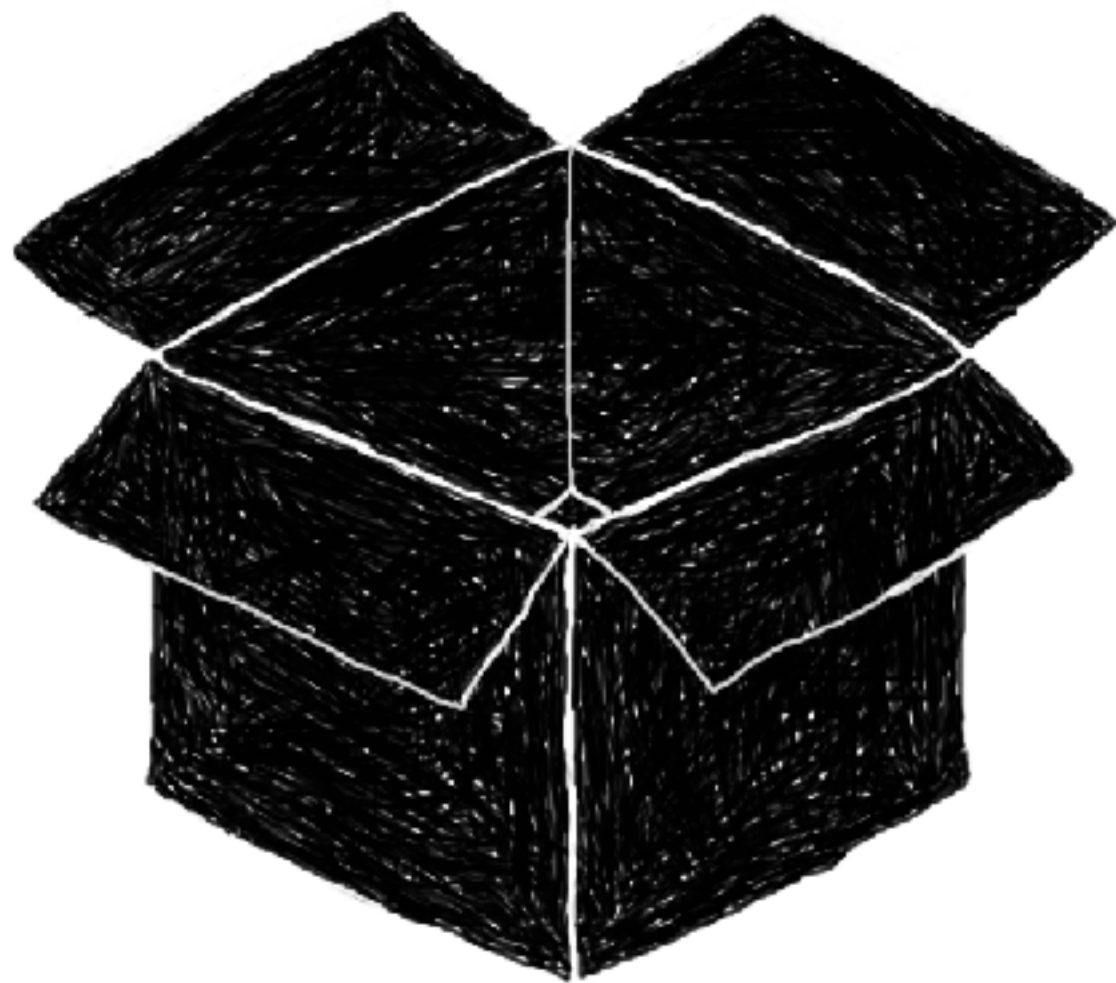


E·S·R·C  
ECONOMIC  
& SOCIAL  
RESEARCH  
COUNCIL











# Humlab



## Following Files

Our research project takes a **software studies and digital humanities approach** towards streaming media.

Our project has not been about, say, altered music listening habits or new forms of media usage. Rather, it has focused the ways in which **technology situates and regulates music consumption**.

Essentially, our project's methodological innovation has been **to 'follow files'** rather than those making, using or collecting them.

## Following Files

There are **different forms of computer files**; they are designed for various purposes (an image, a video, a song) and they (might) contain a bundle of organized data.

And by all means, literally trying to follow 'music files' is a **technical impossibility** in a streaming media context. But as a metaphor—and more importantly, as **a research practice**—the project motto of 'following files' proved to be a rich, stimulating and dynamic approach *vis-à-vis* Spotify and its streaming architecture.

## Following Files

Taking our cue from economic and social anthropology with its interest in **the 'social life' and 'biography of things'**—and inspired both by **the infrastructural turn** in media studies and a digital humanist urge to engage with computational systems—our project has essentially developed an **interventionist approach** that has allowed us to follow the transformation of audio files into streamed experiences in the simple way **a postman would follow the route of a parcel—from packaging to delivery.**





## Under the Hood

Research on **the cultural implications of software**—whether in the form of software studies, digital humanities, platform/infrastructure studies or media archaeology—has repeatedly stressed the need for **in-depth investigations of how computing technologies work**, combined with meticulous descriptions of technical specificities.

Our analyses of Spotify resemble such specific readings of **the computational base**—that is, the mathematical structures underlying programs and interfaces—and hence resonate with media scholarly interests in **technically rigorous ways of understanding the operations of material technologies**.

## Under the Hood

A first thing to note going under the hood is that the Spotify infrastructure is **hardly a uniform platform**.

Rather it is **downright traversed by data flows**, file transfers and information retrieval in all kinds of directions—be they metadata traffic identifying music, aggregation of audio content, playout of streaming audio formats (in different quality ratings), programmatic advertising (modelled on finance's stock exchanges) or interactions with other services (notably social media platforms).

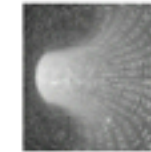
## Under the Hood

Spearheading **the new data economy** of the 21st century, Spotify in many ways resembles **a sprawling network of interaction** that includes musicians and listeners alongside other actors and interests that have **little to do with cultural commodities or media markets in a traditional sense**.

The constant **data exchanges** that occur—ranging from interactions with social media to car manufacturers—are all **located elsewhere**, outside of the so called platform of Spotify.

As a consequence, **we find the platform notion troublesome**, and instead prefer describing Spotify as an open-ended data infrastructure, even if the service hardly provides an open infrastructure for music listening.





## Infrastructure studies meet platform studies in the age of Google and Facebook

new media & society

1-18

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### Abstract

Two theoretical approaches have recently emerged to characterize new digital objects of study in the media landscape: *infrastructure studies* and *platform studies*. Despite their separate origins and different features, we demonstrate in this article how the cross-articulation of these two perspectives improves our understanding of current digital media. We use case studies of the Open Web, Facebook, and Google to demonstrate that infrastructure studies provides a valuable approach to the evolution of shared, widely accessible systems and services of the type often provided or regulated by governments in the public interest. On the other hand, platform studies captures how communication and expression are both enabled and constrained by new digital systems and new media. In these environments, platform-based services acquire characteristics of infrastructure, while both new and existing infrastructures are built or reorganized on the logic of platforms. We conclude by underlining the potential of this combined framework for future case studies.

### Keywords

API, applications, Facebook, Google, infrastructures, networks, Open Web, platforms, programmability, STS

## Under the Hood

**Platform studies** have repeatedly acknowledged **the dual nature of commercial platforms**; YouTube, Facebook, Twitter and the like support innovation and creativity—but also **regulate and curb participation** with the ultimate goal to produce profit for platform owners. In short, platform affordances simultaneously **allow and constrain expressions**.

## Under the Hood

Spotify, however, differs from traditional 'web 2.0'-platforms. There is, after all, a difference between Spotify and SoundCloud (or YouTube for that matter).

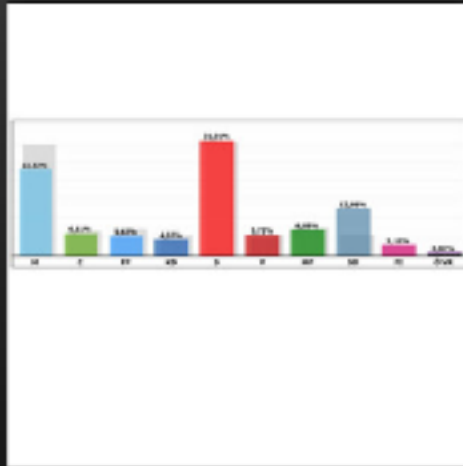
The term platform is therefore both problematic and inadequate when studying Spotify. Instead, we have opted for **the term "infrastructuring" as a lens for analyzing the contested landscape of technology, knowledge, and processes that form contemporary digital markets**, as well as a concept for bringing together **all the heterogeneous elements that make Spotify happen**.

interventions

## Record Label Set Up

One intervention has been aimed at studying the back end of streaming services and different **music aggregation processes** by way of launching **a record label**—and **self-produced 'music'**—for research purposes.

A starting point for our record label interventions has been the recognition that digital corporations like Spotify are not open to inspection. This implies that there is a need to find new methods for studying them, and **by producing and distributing our own music**, we have investigated how sounds gets inserted into streamed distribution circuits—and what happens to the music once it's there.



ALBUM

# Election Music

By Heinz Duthel

2014 • 13 songs, 11 min

PLAY

SAVE

...

#		TITLE		🕒	👍
1	+	Riket		0:46	🔊
2	+	Biskopsgården N		1:10	🔊
3	+	Täby		0:44	🔊
4	+	Spökparken		0:46	🔊
5	+	Rinkeby		1:12	🔊
6	+	Hörken		0:50	🔊
7	+	Knäred		0:48	🔊
8	+	Mullejö		0:44	🔊

[http:// open spotify](http://open.spotify.com/album/1a2b3c4d5e6f7g8h9i0j)




# FRU KOST

EP nr. 1



Hi there,  
Thanks for the form, I'm afraid this isn't the kind of content we're  
looking to sign up currently. Sorry about that.  
We wish you all the best.

Cheers,  
  
Client Services Manager

---

Awal Digital Limited  
Registered in England & Wales  
Company Registration: 4430703  
VAT Registration: GB774150334  
Registered Office: 4 Valentine Place, London, SE1 8QH

[www.awal.com](http://www.awal.com)



Från: @routenote.com  
Ämne: FRUKOST Disapproved  
Datum: 20 oktober 2014 19:02  
Till: strokultarv@gmail.com



Hi FruKost,

We're sorry, your release FRUKOST has had to be disapproved by RouteNote for the following reason(s):

RouteNote only distributes music content, we cannot distribute silent tracks etc.

This release has been cancelled and will need to be re-uploaded after the specified changes have been made

If you have any problems regarding this album please do not hesitate to contact our team at [support@routenote.com](mailto:support@routenote.com). Make sure you include your username and UPC of the release you are inquiring about.

Many warm regards,

The RouteNote Team



ARTIST

# Fru Kost

PLAY

FOLLOW

...

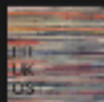

MONTHLY LISTENERS  
2

OVERVIEW

ABOUT

CONCERTS

## Popular

	1	+	Kaffe	6,983
	2	+	Avplock	< 1,000

## #backaspotify

During spring 2016 an entrepreneurial campaign to support Spotify suddenly erupted in Swedish social media. On Twitter it rapidly became known within Stockholm hipster-business circles as **#backaspotify**.

The peculiar thing with the #backaspotify campaign was that it swiftly framed itself as **a local business action in support of Spotify**. The climax of the campaign was reached when the Stockholm Chamber of Commerce hosted a support rally for Spotify with a number of prominent speakers.





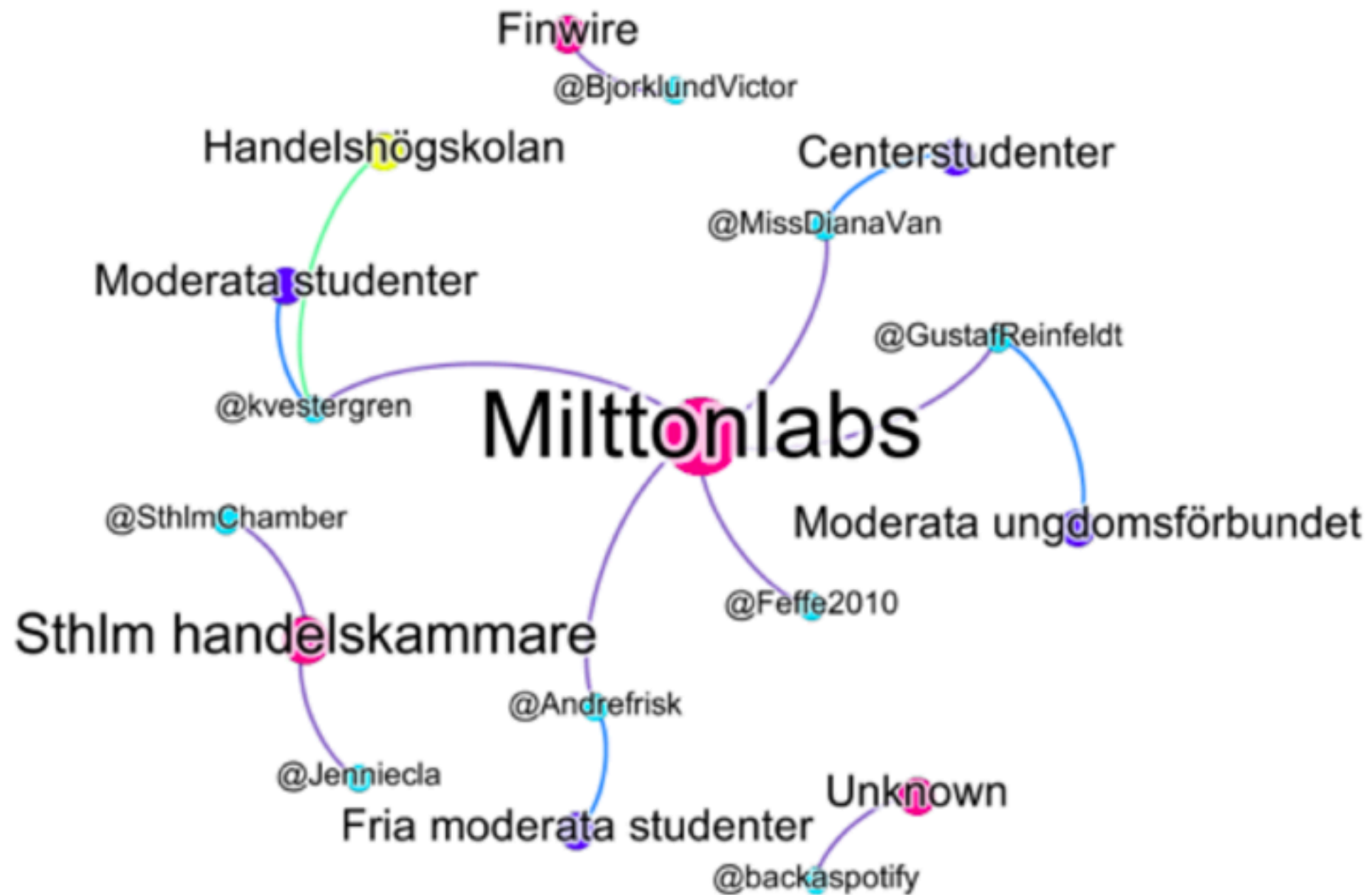
#backaspotify

## #backspotify

Collaborating with Christopher Kullenberg at the University of Gothenburg we used the Python module Tweepy and **downloaded 1,791 tweets**, by requesting all Twitter messages containing the word “backspotify” (which included the hashtag #backspotify).

The campaign was short-lived, however. It started fading out already after a few weeks during late spring 2016.

Still, the **analytical narrative** around it, the different events and a broader network analysis of the collected tweets make #backspotify an illustrative example of **the political significance of Spotify in Sweden**.



## #backaspotify

In short, by advocating a more liberal business climate, the #backaspotify campaign clearly had an **ideological purpose**. Swedish right wing parties saw the opportunity to align themselves with a globally successful company, trying to win approval for **entrepreneurial political ideas**.

Since the Stockholm Chamber of Commerce is the leading **business organisation** for Sweden's' capital region, their active role during the campaign is hardly surprising.

Still, our network analyzes of retrieved tweets from #backaspotify also reveal a number of distinct linkages to persons and organizations on **the political right wing spectrum**.



#backaspotify

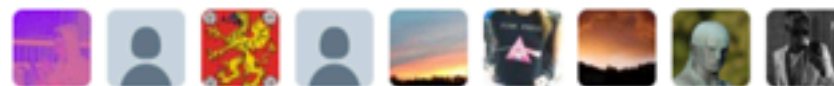


RETWEETS

41

LIKES

46



11:20 AM - 12 Apr 2016

## Work at Spotify

In a similar manner we are currently working with a textual corpus of some **800 Spotify job advertisements** that we have scraped.

**open\_spotify\_job\_excelsheet**

## Digital Methods

Through the notion of 'following files' at Humlab our project has developed a **habitual way of working with digital methods** to understand Spotify's general streaming architecture.

By taking the catchphrase "**the system is the method**" (Klaus Bruhn Jensen) serious and sincere, we have focused on **different ways to extract and pull data**—via interventions and experiments—from the 'Spotify system'.

## Digital Methods

Spotify **churns out endless data through the very act of music listening**, and basically all data (as evidence) needed for the kind of digital studies we have performed is (potentially) already at hand.

Such data are “documented in and of the system”, following Bruhn Jensen, and “with a little help from network administrators and service providers” it can be used as the empirical base for research.

This is how we have co-worked with the Humlab programmers. We have also tried **to think “with the devices”**, acknowledging that **as a research practice digital methods** in general “strive to follow the evolving methods of the medium” (Richard Rogers).

## Digital Methods

Over the last decade a number of different digital methodologies have been developed and deployed to perform social science or humanistic inquiries on big (or mid size) data and black-boxed media services (as Spotify).

They have pioneered ways to analyse and understand the Internet and the Web, as well as digital media production, distribution, and consumption **not through the usual interviews or postal surveys—but via the specificity of the digital medium.**



# Så trångsynt att man blir mörkrädd

För en tid sedan skrev jag ett utlåtande kring en österrikisk konstvetare som nominerats till landets finaste akademiska pris, Wittgenstein-Freis. Jag var positiv eftersom han försökt förändra konstvetenskap till ett slags bildvetenskap. Men eftersom jag också ombads att vara kritisk, ifrågasatte jag vad karln egentligen studerade. I en tid när alla medier reducerats till data, hur bedriver man då bildvetenskap? Hur analyserar man exempelvis den sociala bildplattformen Snapchat, där alla skickade fotografier bokstavligen försvinner efter tio sekunder? Snapchat handlar ju mindre om bilder, och långt mer om dataflöden och social interaktion.

## Debatt Mediepolitik



Pelle Snickars är professor i medie- och kommunikationsvetenskap med inriktning mot digital humaniora vid Umeå universitet.

finns exempelvis inte ett ord om sociala medier, men desto fler om "massmedier". Det känns 1985. Inom delar av den medie- och kommunikationsvetenskapliga forskning som av tradition backar upp mediepolitiken är det nästan lika illa ställt. Vad som länge dominerat sådan forskning är innehållsanalyser av journalistik i stil med representationen av X i mediet Y – tänk: "bilden av landsbygden i Dagens Nyheter" – utförda från snäva demokrati- och politikperspektiv. Nu handlar den diskussionen om så kallade "nyhetsundvikare", där högst normativa undersökningar försöker påvisa att folk struntar i nyheter. De kan sammanfattas i en rad: "så dumt att folk läser fel – fara för demokratin". Det är medieforskning som paternalistisk politik.

**Att Facebooks, Twitters eller Instagrams flöden för alltför komplett definierat om vad en nyhet de facto är –**



**Min poäng här är inte att vara inom-akademiskt kritisk, utan att påvisa hur den här typen av daterad medieforskning delvis ligger till grund för den nationella mediepolitiken. Så kan vi inte ha det.**

de läser. I senaste Mediebarometern kan man ta del av "lyssnande till musik på ... vinylskiva".

Just självuppskattad medieanvänd-



# SOM survey

DE FÖRSTA FRÅGORNA GÄLLER VILKA MASSMEDIER DU TAR DEL AV

**FRÅGA 1.** Hur ofta brukar Du titta på eller lyssna till följande typer av nyhetsprogram i radio och TV?

	Dagligen	5-6 ggr/ vecka	3-4 ggr/ vecka	1-2 ggr/ vecka	Mer sällan	Aldrig
(17) Nyheter i lokalradion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(18) Aktuellt i TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(19) Rapport i TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(20) Dagens Eko i riksradien	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(21) Regionala nyheter i TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5	6

**FRÅGA 2.** Hur mycket brukar Du se på av följande typer av TV-program?

	Allt/i stort sett allt	Ganska mycket	Inte särskilt mycket	Ingenting/Nästan inget alls
(22) Underhållningsprogram	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(23) Nyhetsprogram	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(24) Dokumentär- och samhällsprogram	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(25) Sportprogram	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(26) Kulturprogram	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4

**FRÅGA 3.** Vilken morgontidning brukar Du läsa regelbundet?  
(Med regelbundet menas här minst ett nummer per vecka. Om Du läser mer än en morgontidning - ange vilken Du betraktar som Din lokala morgontidning).

(27) 1 .....  
(Tidningens namn)

☐ 2 Läser ingen morgontidning regelbundet

1986

**NYHETER & MEDIER**

**Fråga 1** Hur ofta brukar du ta del av följande nyhetsprogram eller nyhetstjänster?

	Dagligen	5-6 dagar/ vecka	3-4 dagar/ vecka	1-2 dagar/ vecka	Mer sällan	Aldrig
Lokala nyheter från Sveriges Radio (SR)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ekonyheter från SR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P3 Nyheter från SR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aktuellt/Rapport från SVT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regionala nyheter från SVT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TV4 Nyheterna	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Fråga 2** Läser eller tittar du regelbundet i någon morgontidning på papper?

☐ Jag läser aldrig någon morgontidning på papper

	Dagligen	5-6 dagar/ vecka	3-4 dagar/ vecka	1-2 dagar/ vecka	Mer sällan
..... (morgontidningens namn)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Fråga 3** Hur ofta brukar du ta del av nyheter från följande?

	Dagligen	5-6 dagar/ vecka	3-4 dagar/ vecka	1-2 dagar/ vecka	Mer sällan	Aldrig
Aftonbladet ...på papper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...på internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expressen/GT/Kvällsposten ...på papper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...på internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Fråga 4** Hur ofta brukar du ta del av nyheter från följande på internet?

☐ Jag tar aldrig del av nyheter på internet

2016

## Digital Methods

Certainly, there are still numerous critical stances towards computational perspectives on media research; at a number of occasions we have ourselves been accused of being proponents for '**digital positivism**'—often from people within media and communication studies.

At the latest Ecrea conference in Prague 2016, for example, senior media scholar **Peter Dahlgren** in his keynote lecture disapproved of data driven research: 'digital positivism' should be abandoned and 'more theory' was instead needed.



## Digital Methods

Those like Dahlgren who are critical towards the **'computational turn'** within the humanities, however, or the inherent methods of digital media, usually **lack hands-on experience** and are hence largely **unfamiliar with actually working with digital methods**.

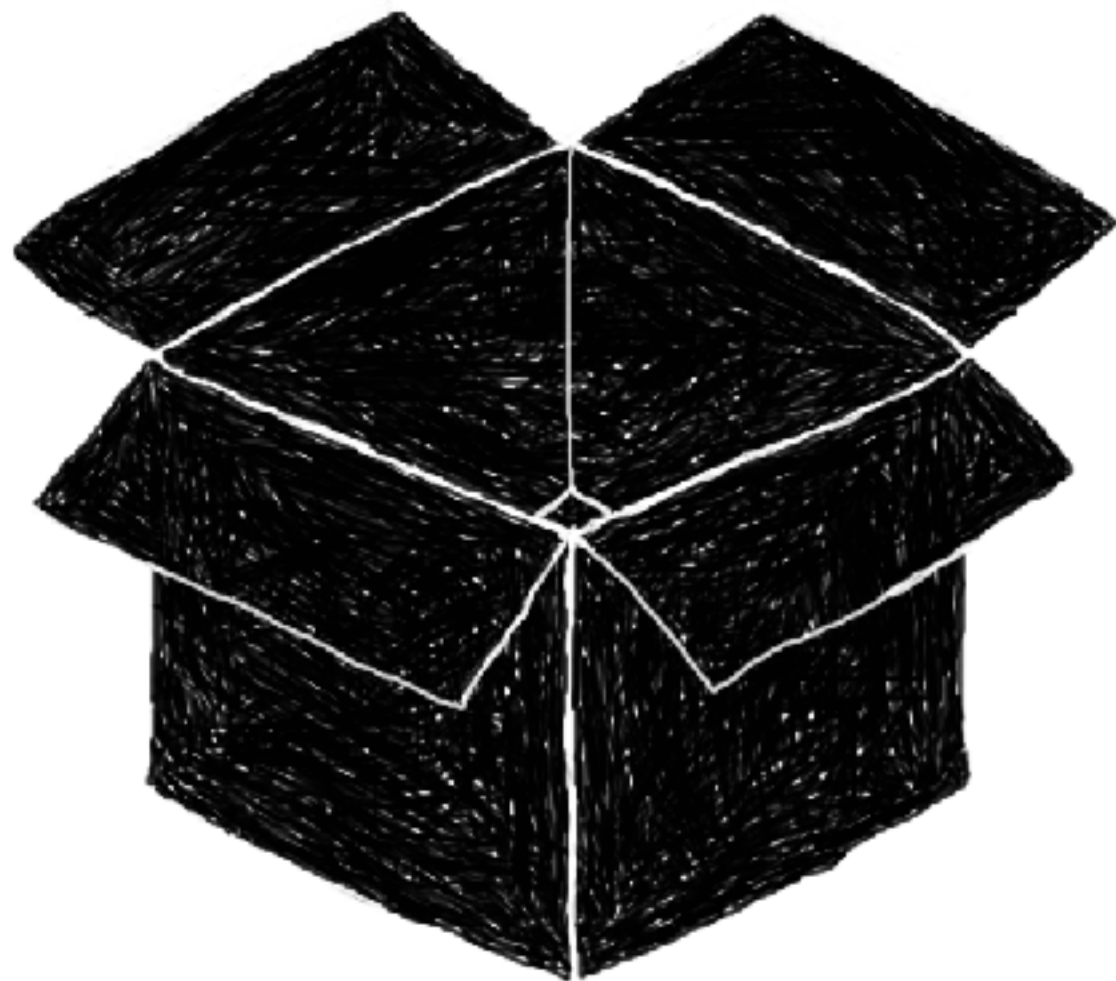
Among scholars using digital methods there is usually an **astute awareness** that data flows at contemporary media services, "do not present us with raw data, but rather with specially formatted information" (Noortje Marres & Carolin Gerlitz).

**Data, in short, are often biased.**

## Lack of Access to Data

Still, the major problem confronting media scholars working with digital methods is the **lack of access to data**. In our project, the main difficulty in doing research on and around Spotify has definitively been **the service reluctance to share any data (with us)**.

Streaming music services are **secretive**—Spotify is no exception. Hence, a general problem within our project has both been that the specifics of **Spotify's algorithms are proprietary** and that **statistics around listener data are essentially a corporate secret**.



## Lack of Access to Data

**"A black box of friendly mysteries"**, is Paul Allen Anderson's canny description of streaming music services.

Spotify also resembles a black boxed service, metaphorically as well as practically. One frequent digital method we have used in order to open this box has been trying to **reverse engineer** the 'Spotify system', all in order to 'break into' the hidden infrastructures of digital music distribution revealing its underlying norms and structures.

As a research strategy, reverse engineering **starts with the final and implemented product, and tries to take it apart** "seeking clues as to why it was put together in the way it was and how it fits into an overall architecture" (Gehl).

# Reverse Engineering Social Media

Software, Culture, and Political Economy in New Media Capitalism

Robert W. Gehl

bots as informants

## Bots as Informants

Since Spotify user data is not available, it has had to be acquired and compiled through other means in order to perform research—foremost by **deploying bots as research informants**.

Essentially, **the bots (software robots)** we have programmed are **scripted algorithms** that exhibit human-like behavior (in one way or the other) when ‘listening’ to music.

Implemented in the Python programming language, our bots have been designed to program user activities and—importantly—**log and record output of these (i.e. customize scheduling, actions and logging of outcomes)**.


## Bots as Informants

Bots **appear to be human**—which is why they are interesting. Bots give an impression of being able to act as a normal user and/or person.



# Bots as Informants—Spotify Radio





Artist Radio based on  
Boards of Canada



★ If You Stayed Over  
Bonobo

🗨️ 👍

Your Stations

Station 1	Station 2	Station 3	Station 4
			
Thought You Mig...	Incubus	Audioslave Audioslave	Lil Wayne

## Bots as Informants—Spotify Radio

The experiment used bots as research informants and sought to critically investigate **the prospective lure of infinite archives via the radio functionality at Spotify.**

## Bots as Informants—Spotify Radio

For commercial reasons Spotify Radio claims to be both personalized and never-ending. Our hypothesis, however, was that Spotify Radio **did not consist of an infinite series of songs**. Rather music seemed to be delivered in limited loop patterns.

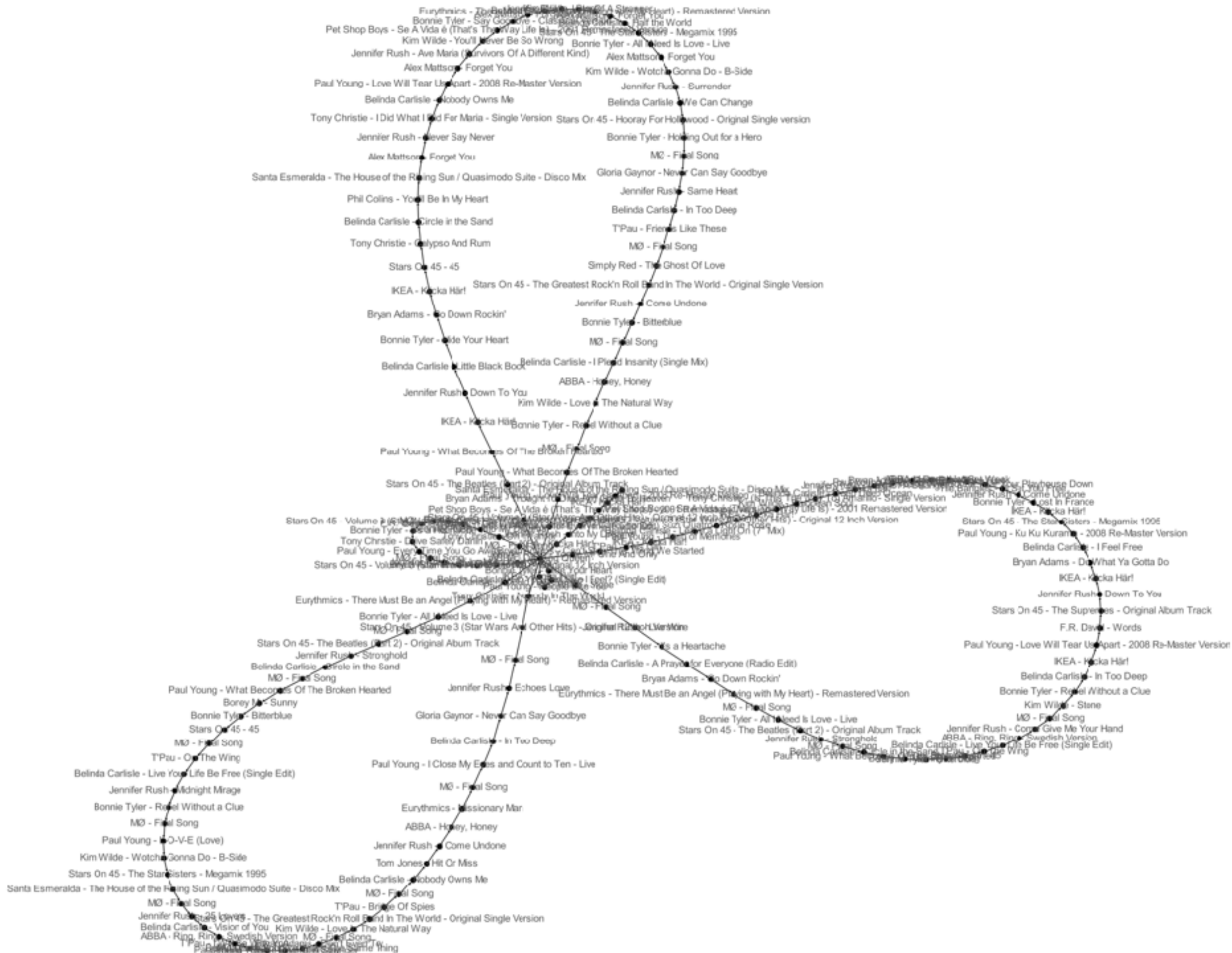
In order to answer these questions we set up an experiment with the purpose to examine several Spotify Radio loops. Essentially, our loops were constructed using **160 'bot listeners'**.

## Bots as Informants—Spotify Radio

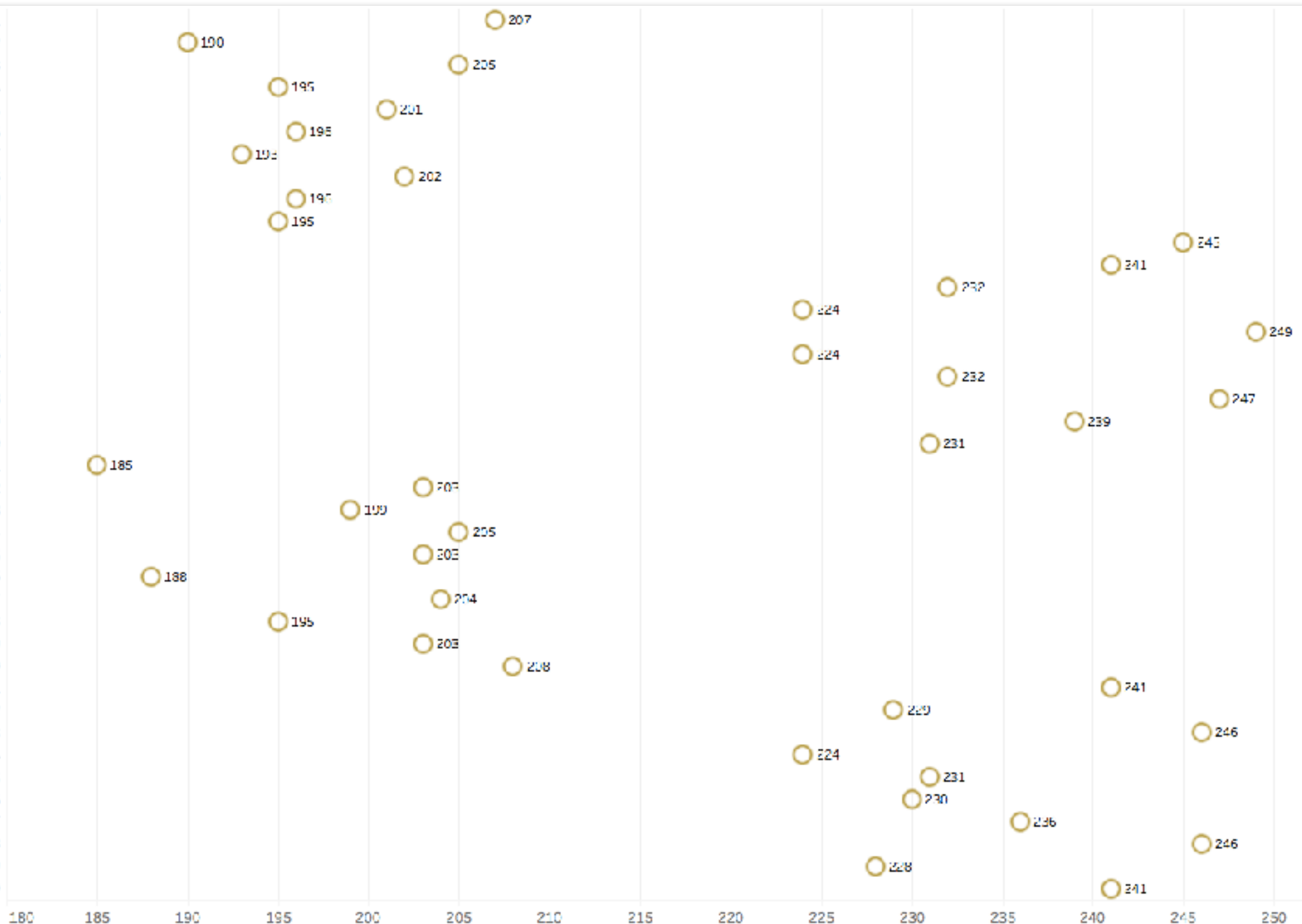
All of our bots were **Spotify Free users**—with literally no track record. They were programmed and designed to search for a track, retrieve subsequent songs, partially interact, and importantly **log all data** caused by different 'actions'.







Jane.09.Lead.01  
Jane.09.Lead.02  
Jane.09.Lead.03  
Jane.09.Lead.04  
Jane.09.Lead.05  
Jane.09.Lead.06  
Jane.09.Lead.07  
Jane.09.Lead.08  
Jane.09.Lead.09  
Jane.09.Lead.10  
Jane.10.Lead.01  
Jane.10.Lead.02  
Jane.10.Lead.03  
Jane.10.Lead.04  
Jane.10.Lead.05  
Jane.10.Lead.06  
Jane.10.Lead.07  
Jane.10.Lead.08  
Jane.10.Lead.09  
Jane.10.Lead.10  
Jane.11.Lead.01  
Jane.11.Lead.02  
Jane.11.Lead.03  
Jane.11.Lead.04  
Jane.11.Lead.05  
Jane.11.Lead.06  
Jane.11.Lead.07  
Jane.11.Lead.08  
Jane.11.Lead.09  
Jane.11.Lead.10  
Jane.12.Lead.01  
Jane.12.Lead.02  
Jane.12.Lead.03  
Jane.12.Lead.04  
Jane.12.Lead.05  
Jane.12.Lead.06  
Jane.12.Lead.07  
Jane.12.Lead.08  
Jane.12.Lead.09  
Jane.12.Lead.10



## Bots as Informants—Spotify Radio

The logs the bots produced made it possible to empirically sustain claims of **repetitiveness within Spotify Radio**, and indeed prove that (at least) **artist iterance** was quite striking.

Regularity of patterns were prominent, and music loops definitively **not endless**. On the contrary, they displayed a **repeated pattern**, with only slight variations depending on which artist a radio station was based on.

One example was the way that a particular track—that we based our radio stations on—kept returning in the bot playlists. **If a 'radio loop' started with "Dancing Queen", after some 50 tracks (or so) it was played again by the Spotify Radio algorithm(s).**



## Bots as Informants—Gendered Music

Another experiment (with numerous bots) investigated **gendered patterns** in music recommendations. The experiments identified **three ways in which gender came to matter in Spotify's music deliveries**:

## Bots as Informants—Gendered Music

- > the extent to which male and female bots were given artist recommendations that diverged from the taste pattern of the majority.
- > the extent to which male and female bots were targeted with gender-specific artist recommendations.
- > the extent to which bots had been recommended music by either male or female artists.

## Bots as Informants—Gendered Music

Spotify did appear to treat some male and female registered bots **slightly differently**, albeit in somewhat incoherent ways. The analysis also showed that some artists were more often recommended to either male or female accounts, most notably in the **'male' rock genre**.

Our analysis did not indicate that Spotify's music recommendation algorithms assumed that male and female registered bots had a **greater tendency to like artists of their own (or their opposite) gender**.

However, the analysis did show that Spotify's music recommendations were heavily geared towards **recommending music by male artists**.



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# Spotify Teardown

## Inside the Black Box of Streaming Music



**– thanks!**

