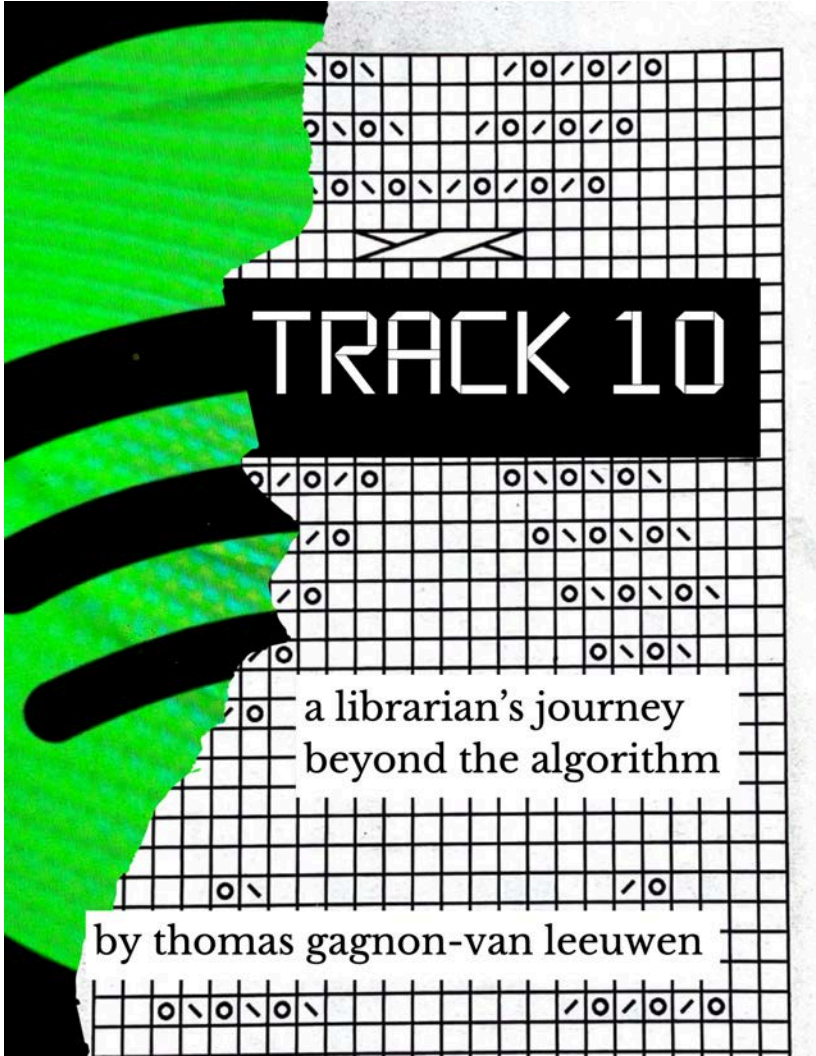


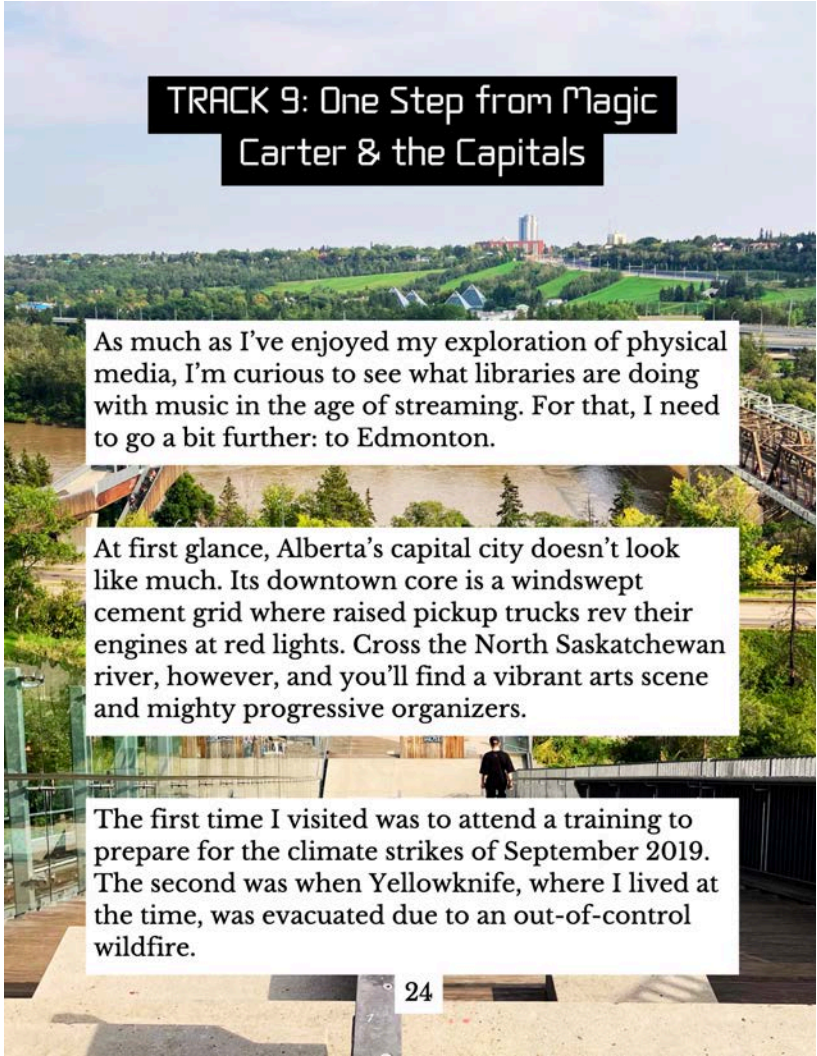
what if algorithms were not inevitable?



# TRACK 10

a librarian's journey beyond the algorithm

by thomas gagnon-van leeuwen

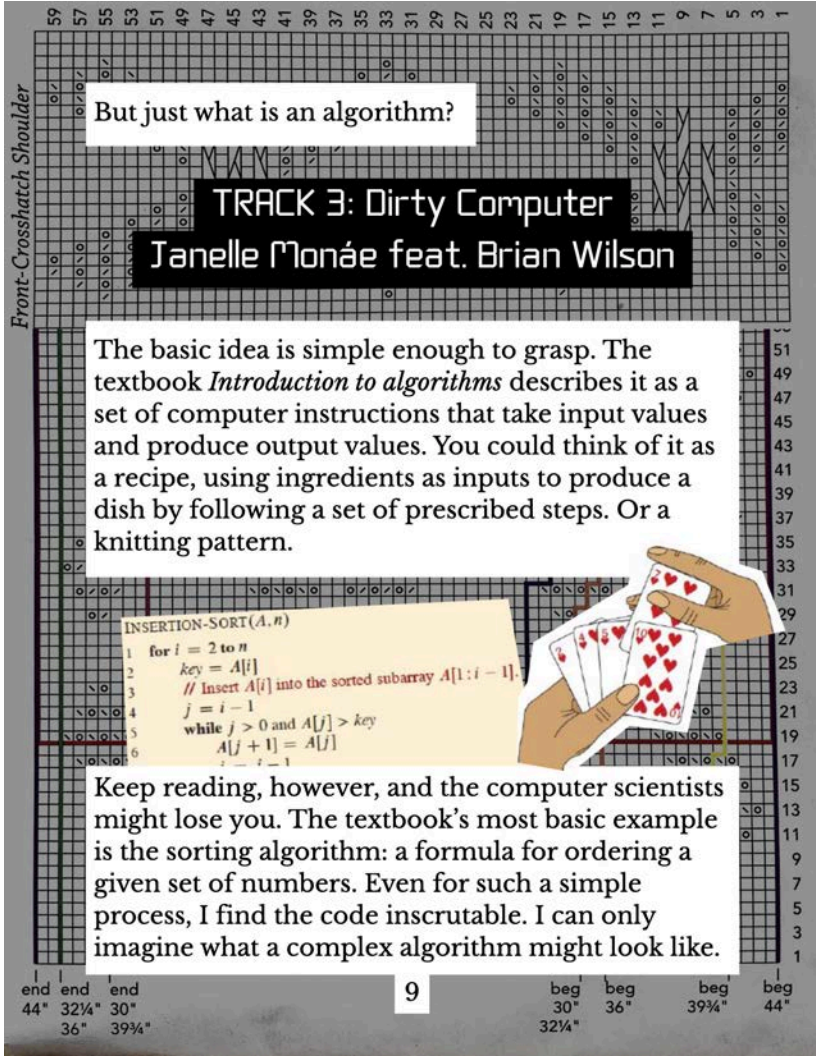


## TRACK 9: One Step from Magic Carter & the Capitals

As much as I've enjoyed my exploration of physical media, I'm curious to see what libraries are doing with music in the age of streaming. For that, I need to go a bit further: to Edmonton.

At first glance, Alberta's capital city doesn't look like much. Its downtown core is a windswept cement grid where raised pickup trucks rev their engines at red lights. Cross the North Saskatchewan river, however, and you'll find a vibrant arts scene and mighty progressive organizers.

The first time I visited was to attend a training to prepare for the climate strikes of September 2019. The second was when Yellowknife, where I lived at the time, was evacuated due to an out-of-control wildfire.



But just what is an algorithm?

## TRACK 3: Dirty Computer Janelle Monáe feat. Brian Wilson

The basic idea is simple enough to grasp. The textbook *Introduction to algorithms* describes it as a set of computer instructions that take input values and produce output values. You could think of it as a recipe, using ingredients as inputs to produce a dish by following a set of prescribed steps. Or a knitting pattern.

```

INSERTION-SORT(A, n)
1 for i = 2 to n
2   key = A[i]
3   // Insert A[i] into the sorted subarray A[1:i-1].
4   j = i - 1
5   while j > 0 and A[j] > key
6     A[j + 1] = A[j]
   A[j + 1] = key
  
```

Keep reading, however, and the computer scientists might lose you. The textbook's most basic example is the sorting algorithm: a formula for ordering a given set of numbers. Even for such a simple process, I find the code inscrutable. I can only imagine what a complex algorithm might look like.

This zine is part of a series of resources produced by Library Futures interns in Summer 2025. The content does not necessarily reflect the official position of the organization.

[libraryfutures.net](http://libraryfutures.net)

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Thank you to Library Futures for giving me the opportunity to explore this topic with rigor and creativity. To Laura, my project advisor, for encouraging me to lean into my writing. To Amanda, my mentor, for tending to the rose garden. To Audrey, my library school professor, for designing the seminar in which I first got to think about these ideas with others. To my fellow interns, for your ideas, enthusiasm and reflections. To the librarians who push our field forward, for inspiring me to make it my professional home.



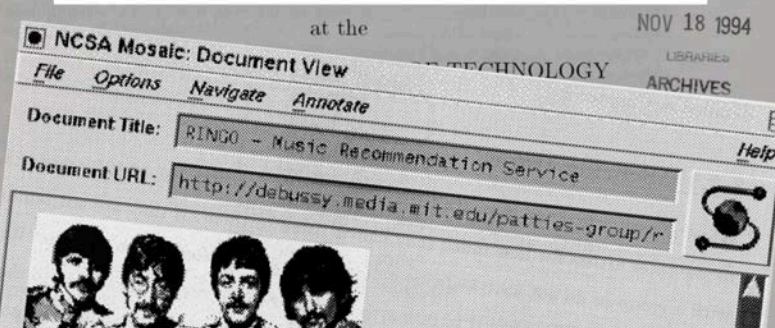
31

## Social Information Filtering for Music Recommendation

### TRACK 4: With A Little Help From My Friends — The Beatles

Submitted to the Department of Computer Science in partial fulfillment of the requirements for the degrees of

In 1994, MIT student Upendra Shardanand submitted his master's thesis. It described, by all accounts, the first algorithmic music recommendation system: Ringo.



Users interacted with Ringo by email. After rating a list of artists on a scale of 1 ("Pass the earplugs") to 7 ("BOOM! One of my FAVORITE few"), they received personalized recommendations, sometimes with reviews from others.

10



The experience is full of friction: physically going to the library, asking for recommendations, flipping the record halfway. But it's this effort that imbues the music with meaning. It's a stark contrast to Spotify executives' grotesque vision for "self-driving music," the idea that the app would be reduced to a single play button. No decision, no friction, just an algorithm.

When the record ends, I'm left with the soft crackle of the needle at the center of the vinyl — and a choice about what to listen to next.

B

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Visit the zine's website for a list of sources and further reading, an accessible online version, or to print more copies. Scan the QR code or go to: [libraryfutures.net/track10zine](http://libraryfutures.net/track10zine).



Thoughts? Send a letter to:

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New York, NY 10012  
USA



de Montréal

25 JUL. 2017













30

BIBLIOTHÈQUE DE DROIT  
UNIVERSITÉ DE SHERBROOKE

Bibliothèque  
BIBLIOTHÈQUE DE  
BIBLIOTHÉCONOMIE ET DES  
SCIENCES DE L'INFORMATION

## TRACKLIST

- 1  **Headlock** 3:35
- 2  **Torn** 4:05
- 3  **Dirty Computer** 2:00
- 4  **With A Little Help From My Friends** 2:44
- 5  **Dancing On My Own** 4:46
- 6  **Strange** 3:19
- 7  **Fool's Gold** 3:02
- 8  **Heartbeat** 3:05
- 9  **One Step From Magic** 3:31
- 10  **Track 10** 5:27

Listen here:



[libraryfutures.net/track10zine](http://libraryfutures.net/track10zine)

This is clearly an unusual request, but my librarian is a good sport. We get into it, chatting about various artists as we Google them ("he's very queer, she just played a great set at the Francos festival, I think you might like their style"). I feel a rush of quiet exhilaration. This stranger is taking time out of his day to suggest music to me. I'm reminded that readers' advisory is a conversation, not a top-down prescriptive process of feeding one piece of "content" after the next. It feels refreshingly human. I walk away with a little slip of paper with five names on it.

The library has a vinyl by one of them, Pierre Kwenders, a queer Montrealer from the Congo who blends African styles with Western pop, electronic and hip hop. I book one of the vinyl players for an hour, sit in a comfy chair and drop the needle on the edge of the record. The music starts.

Pierre Kwenders  
Theodora  
La Zorra  
Zabo de Sagazan  
Vendredi sur mer

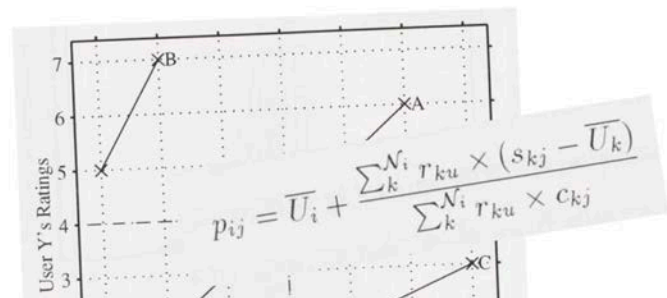
at the end  
of space  
the beginning

22

Artist	Rating	Confidence
"Orb, The"	6.9	fair
"Negativland"	6.5	high

I'd rather dive into a pool of dull razor blades than listen to Yoko Ono sing. OK, I'm exaggerating. But her voice is \*awful\* She ought to put a band together with Linda McCartney. Two Beatles wives with little musical talent.

Never read the comments, even in 1994.



Anyway, what Ringo's algorithm did was compare one person's ratings with all of its other users. It then found people with neighbouring taste and recommended artists they liked. Engineers now call this "collaborative filtering." For Shardanand, it automated word-of-mouth and was meant to be more serendipitous than "content-based filtering." (Today's algorithms mix both approaches.)

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*This page intentionally left blank.*

Rather, I think that there is space between those two extremes for librarians, together with musicians and listeners, to radically reimagine the future of music.

Of course, they already are. We need more digital public spaces like Edmonton Public Library's Capital City Records, built together with communities they serve. We need more physical spaces like the Grande bibliothèque's vinyl listening room. We need to develop digital lending models that are fair to libraries. We need to train librarians to help patrons discover new music based on their desires, not their data. We need to cultivate human curation anchored in our communities.

What comes next is up to us.  
It always was.

at the end  
of space  
the beginning

29

$$\frac{[E(XY)]^2}{(\sum XY)^2} \leq \frac{E(X^2)E(Y^2)}{\sum X^2 \sum Y^2}$$

It's interesting to see the actual math laid out in Shardanand's thesis, especially now that corporate giants hide their algorithms as trade secrets. But I come to realize that "what is more important than the algorithms is the human element," as he wrote.

Even back then, users viewed Ringo as a human-like entity, addressing it in natural language so much that researchers changed their boilerplate messages to be more impersonal. The thesis also anticipated the increasing role that artificial systems would play in our lives:

As long as people believe that an agent is a reflection of themselves, they will enjoy using the agent.

Who doesn't like looking in a mirror occasionally?

here is this system which operates

24 hours a day, grows,

and in a way "learns."

12

## TRACK 8: Heartbeat [feat. anais] Pierre Kwenders

For Chayka, human curators allow us to break out of the blandness of algorithmic culture. Librarians have long acted as links between readers and books, suggesting novels one might enjoy reading for leisure. Could they do the same for music?

On a sunny Friday morning, I return to the fourth floor of the Grande bibliothèque for the first time in twenty years. I notice a new dedicated music room called the Pavilion, with instruments patrons can play, vinyl players and a collection of antique gramophones. Clearly I'm not the only one on a nostalgia kick.

I ask the staff where I might be able to get music suggestions and, after some confusion ("He wants to suggest music for our collection?"), they send me down a few floors to a librarian. It feels vulnerable to expose my taste to another human, but I overcome my initial jitters and ask for something similar to French-Malian singer Aya Nakamura, "something queer or queer-friendly you could dance to."

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To navigate that tension, I draw inspiration from people like tech writer Brian Merchant and artist Molly Crabapple who are reclaiming the Luddite label. They are not against technology or progress itself, but against corporate giants foisting harmful technology onto us. As the original Luddites argued, we need to evaluate whether a technology is “harmful to community” and resist it if it is.

Illustration: Matt Chase for The Atlantic

I feel that the current model of corporate algorithmic streaming — built on the surveillance of its users, designed to maximize listening at all costs and paying pennies to artists — is something we ought to resist. By trading the convenience of the algorithm for a little friction, I found myself opening up space to develop a different relationship to music. One that is more anchored in community, where I feel more agency, where music has context that gives it meaning.

At the same time, the point of my foray into legacy media is not to advocate for a full-scale return to the past. CDs and vinyls still have their place, as a recent rise in sales shows. But we don't need to limit ourselves to them.

Finding a way to play CDs is the real challenge. My library doesn't lend out CD players. I text my dad, but he's already sold my late Oma's setup. I visit a thrift store: no luck. They do have lots of used CDs for \$1.50, however, and I buy a few. On my third thrift store, a growing collection of CDs from 90s divas in my bag, I find a cute Sony hi-fi system that fits my living room bookshelf. I bring it home and excitedly plug it in, but its audio output port doesn't work. Mariah Carey will have to wait.

My foray into CDs, while unsuccessful, does remind me of the advantages of owning physical media, something Aaron Perszanowski and Jason Schultz explore in *The End of Ownership*. The library can buy CDs and lend them on its own terms, instead of having to rely on licence agreements with library vendors that offer music like Hoopla or Freegal. Strangers donated their CDs to those thrift stores, and I bought them for a fraction of the cost of my monthly Spotify subscription. They will sit on my bookshelf until I decide otherwise. I wonder what digital ownership models we might design for libraries to lend music on fair terms.

## TRACK 1: Headlock — Imogen Heap

As the cliché goes, I was a library kid before I became a librarian. As a teenager, I took the metro on Saturday mornings to the newly opened Grande bibliothèque in downtown Montreal and waited for the doors to open. I took the glass elevator to the fourth floor, which housed the music and movie collection. I picked out CDs to borrow, checking off the call numbers I had located in the catalog.

The year was 2005, and I was developing my taste in music. A favorite at the time was Imogen Heap, the iconoclastic electropop musician who went mainstream after her song “Hide and Seek” appeared on *The OC*. Over the next few years, I followed her on YouTube as she vlogged about producing her next record, recording weird sounds in a big house in the British countryside — an early example of an artist engaging their fan base on social media.



## TRACK 5 Dancing On My Own — Robyn

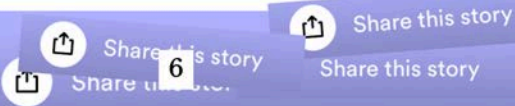
If I had to pick one country as my musical home, it would be Sweden. ABBA was my first favorite artist, in no small part due to the fact they came first in my parents' iTunes alphabetically-ordered collection. The first band I remember listening to on my bulky iPod is Ace of Base, a classic of 90s Europop.

Robyn released “Dancing On My Own” in the spring of 2010, which became an instant classic in the queer circles in which I moved during my university years. She graced billboards when I visited Stockholm a few months later, parroting the subway announcements to practice my Swedish (“*Nästa: Kungsträdgården!*”).

Fast-forward to the late 2010s, when I traded my carefully curated iTunes collection for a Spotify subscription. A “cold start,” as the industry calls it: when a new user signs up for an algorithmic platform for whom they don’t have any data.

A few years in, as the pandemic supercharged our screen time, I started feeling uneasy about Spotify. I was discovering new music, but I felt little connection to it. My Spotify Wrapped felt like a distorted mirror image of the music that I actually connected with (did I really like Taylor Swift *that much?*). I felt a bit offended at some of the algorithm’s suggestions.

Around this time, I decided to become a librarian. Joining a profession built on providing equitable access to information and culture was an opportunity to explore these feelings. I wasn’t loving the algorithm’s answer to the question “What’s next?”. How, I wondered, might a librarian answer it differently?



### TRACK 10 – Charli xcx

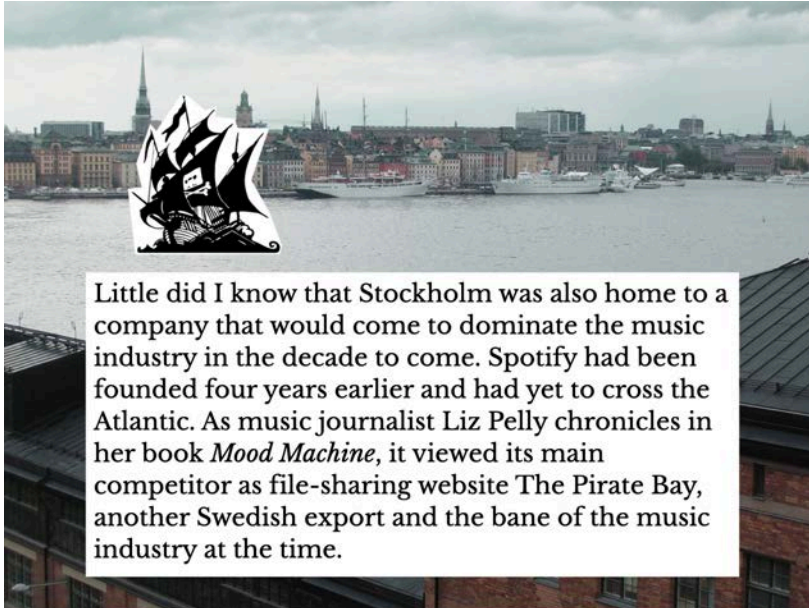


If the algorithm autoplayed Charli xcx’s “Track 10,” I probably would have skipped it. It opens with an unpleasant, garbled, distorted screech. At 5:27, it flouts the platforms’ incentive to keep songs short (a 30-second stream is enough to earn a royalty).

Thankfully, I discovered it during an embodied, real-life experience: in a sweaty arena show, following the breakout success of her album *Brat* which painted summer 2024 neon green. The song now reminds me of the joy of that moment. How I came across the song gives it meaning.

In a way, “Track 10”’s futuristic, auto-tuned sound also points to the question at the core of my journey to go beyond the algorithm: what role should technology play in how we discover and listen to music? And who gets to design, control and own that technology?

Photo: Raph\_PH



Little did I know that Stockholm was also home to a company that would come to dominate the music industry in the decade to come. Spotify had been founded four years earlier and had yet to cross the Atlantic. As music journalist Liz Pelly chronicles in her book *Mood Machine*, it viewed its main competitor as file-sharing website The Pirate Bay, another Swedish export and the bane of the music industry at the time.

Spotify’s founders were more interested in advertising than music. It’s no surprise that its recommendation algorithm relied on tracking its users’ behavior in minute detail, just like the advertising-funded web giants that developed what Shoshanna Zuboff calls “surveillance capitalism.” While early algorithms like Ringo asked users for explicit feedback, giving them some measure of autonomy in the process, now there is no escaping Spotify’s watchful eye.

I can also trust that no commercial considerations influence what I’m seeing. In Spotify’s own words:

In some cases, commercial considerations may influence our recommendations. For example, Spotify offers a promotional tool that enables artists and record labels to highlight priority songs, increasing the likelihood of them being recommended in specific algorithmic playlists: Radio, Autoplay and certain Mixes.

Is a given song chosen because it’s the best match or because it’s sponsored?

For streams of those priority songs generated in impacted playlists, Spotify charges a commission.

What am I *not* being recommended from artists who refuse to take part in this scheme?



I end up borrowing a CD by Lianne La Havas, which is on display, because I confuse her for Lhasa De Sela, a local musician who died of breast cancer at the age of 37. A park that I pass on my daily commute is named after her.

It’s a silly mistake, but it feels a little like true serendipity. I’ve never listened to Lhasa De Sela’s music. Maybe I should.

OPENING FRIDAY, AUG. 9

AUSTRALIAN  
JAZZ

What I love about the Edmonton model is that it's not just a collection — it's also a digital public space. It includes profiles of local music legends with stories, photos and clips of interviews. It preserves the history of music venues that have closed. That hits close to home for me in Montreal, where gentrification and noise complaints are shuttering one small venue after another.

Streaming a playlist curated by the library, I feel like I'm glimpsing into a possible future for music. An antidote, perhaps, to algorithmic streaming's hyper-individual, atomized way of listening. A return to the early promise of the Internet as a democratizing force, a model of public ownership and community governance that puts people before profit.

## TRACK 7: Fool's Gold Lhasa De Sela

I'm at my local library to pick up a hold when I decide to check out the CD collection. After searching the catalog to make sure there actually are CDs at this branch, I find a few metal shelves near the teen section.

Being confronted with the library's CD collection feels almost aggressively non personalized. Instead of Spotify's heavily customized, ever-changing homepage, I can take in the library's collection at a glance. Seeing categories like "jazz" or "classic" reminds me that there are entire genres of music that I never listen to.

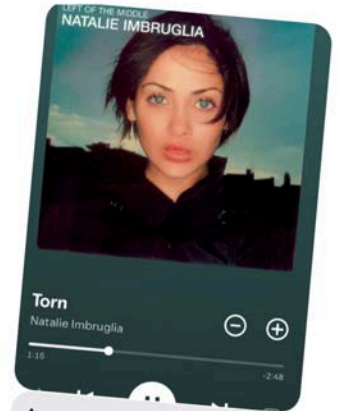
anglophone

The "francophone" category especially gives me pause. Quebec is a French province with its own cultural ecosystem in a sea of English in North America. French is my mother tongue — I learned English second. Yet I can't remember Spotify ever recommending francophone music to me. The library is anchored in my local context, while on Spotify I float in a sea of shifting data points.

## TRACK 2: Torn — Natalie Imbruglia

Algorithms loom large in our imagination. "Our" algorithm can feel like a mirror-image of our inner self (albeit a distorted one), a bit like the dæmons in Philip Pullman's fantasy series *His Dark Materials*.

For much of 2024, my Spotify algorithm constantly autoplayed Chappell Roan's song "Good Luck, Babe!". I came to resent the algorithm for ruining a song that I would have otherwise enjoyed.



Are you fucking kidding me Spotify



Photo: Justin Higuchi

Meanwhile, a friend texted me that her algorithm was obsessed with Natalie Imbruglia's "Torn." Who doesn't love the 90s?

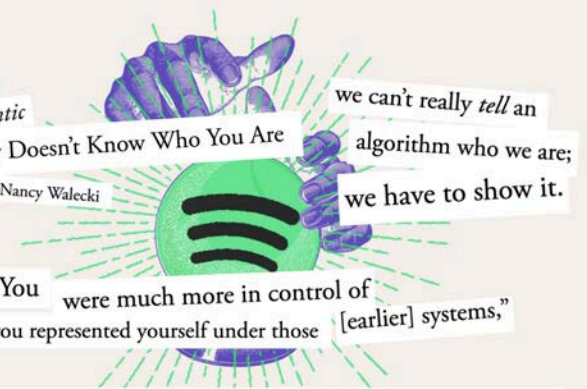
I love torn!!

Illustration:

The Atlantic

Spotify Doesn't Know Who You Are

By Nancy Walecki



we can't really tell an algorithm who we are; we have to show it.

"You were much more in control of how you represented yourself under those [earlier] systems."

The biggest flag was when users stopped listening. Anthropologist Nick Seaver details in his book *Computing Taste* how streaming platforms wanted to maximize engagement, or the "hang-around factor" in industry-speak. They wanted to keep listeners hooked, measured by "captivation metrics."

This is where I hit a wall with understanding algorithms by focusing on the code itself. Even if I could infiltrate Spotify and look at lines and lines of jealously-guarded code, I would be totally lost. There isn't just one algorithm, but many different ones slicing and dicing behaviour into bits of data that are then fed into equations, and algorithms to coordinate other algorithms. Instead, maybe the best way to understand algorithms is to look at how they changed our relationship to music.

It's not just me and my friend. Participants in an academic study also talk about the Spotify algorithm as if it was an entity of its own, towards which they have a range of feelings.

### Exploring users' algorithmic knowledge and reflexivity in a music streaming context: A critical realist approach

Sebastian Cole  
University of Oslo, Norway

I don't think that Spotify knows me very well.

For me, algorithms are supposed to help me, care for me, know me.

That's what they're supposed to do [but they don't]

participants like Ingrid and William refer to Spotify as 'a good friend'.

I know I am feeding the algorithm, and for me, it's inevitable.

... just take my data.

as long as you give me the music, I don't really care.

8

### TRACK 6: Strange — Galaxie 500

I open Spotify to play background music as I read Kyle Chayka's book *Filterworld* as research for this zine. In a split second, I select one of the eight albums or playlists that the algorithm has selected for me. I don't really make a conscious decision: it's automatic.

Our music taste goes to the core of who we are. (Closeted teenage boys who hide their love of Britney Spears are well acquainted with the idea.) But as Chayka points out, "taste is not passive — it requires effort." It needs elements of surprise, challenge and risk.

Spotify, however, was built from day one on eliminating friction. If playing a song on Spotify was more convenient than torrenting it on The Pirate Bay, Spotify would win out — and it did.

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Photo: Mack Male



This Universe (Feat. Dunna)

Edmonton is also home to Capital City Records, a community-driven local music streaming platform created by the Edmonton Public Library. It follows a model pioneered by the Iowa City Public Library and replicated around North America.

Your Master's Wishes

Concealer

R3D AI

**CAPITAL CITY RECORDS**  
EDMONTON LOCAL MUSIC

FR3AI

Taurus -

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Pelly explains how it works. Curators made up of the local music scene and library staff choose which artists to add to the collection once a year. The library then licences the music directly from artists for a set fee. In Edmonton's case, anyone on the Internet can stream the music for free, and the library's patrons can download it.

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Capital City Records music is for personal use and users agree not to sell or otherwise distribute or stream or downloaded materials.

One of its most fateful design choices came in 2017. Chayka tells the story of how, on a specific day, streams of the song "Strange" by Galaxie 500 started rising sharply compared to the band's other songs. It was the day Spotify turned on autoplay by default. Spotify's own "data alchemist" investigated and concluded that it was because the song was their most generic. Users were less likely to skip it or stop listening when it came on. "Strange" had won the algorithmic jackpot. It was frictionless.

After reading this story, I become a bit obsessed with the idea that we've traded friction for convenience. I decide to add friction to my music listening and see what happens.

One day, walking home from the pool, I turn off autoplay. Half a block from my apartment, I realize the music has stopped. The silence feels like a relief. I'm more alert, noticing the flowers growing on my balcony. Maybe it comes from not having to monitor the algorithm to actively turn off the music when it inevitably begins to annoy me. Or maybe it's having the choice to start listening to something else, or nothing at all. In the pause, I feel more agency and, dare I say, freedom.

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