



Algorithmic Literacy

the role of academic libraries in creating
metaliterate learners

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Introduction



Marta Samokishyn

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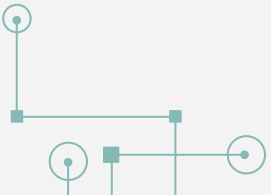
This project is supported by the BCcampus Research Fellows Program, which provides BC postsecondary educators and students with funding to conduct small-scale research on teaching and learning, as well as explore evidence-based teaching practices that focus on student success and learning.

Land Acknowledgement



I am located on the traditional unceded, unsurrendered territory of the Anishinaabe Algonquin People. The peoples of the Anishinaabe Algonquin Nation have lived on this territory for millennia. Their culture and presence have nurtured and continue to nurture this land.

I embrace the responsibility to help ensure that the next generations of land stewards are respectful and grateful for the bounty of this land on which we live, work, play, and study.



Agenda



01.

Metaliteracies

Role of algorithmic literacy in digital and information literacies

02.

Algorithmic literacy

Definition & issues

03.


Teaching

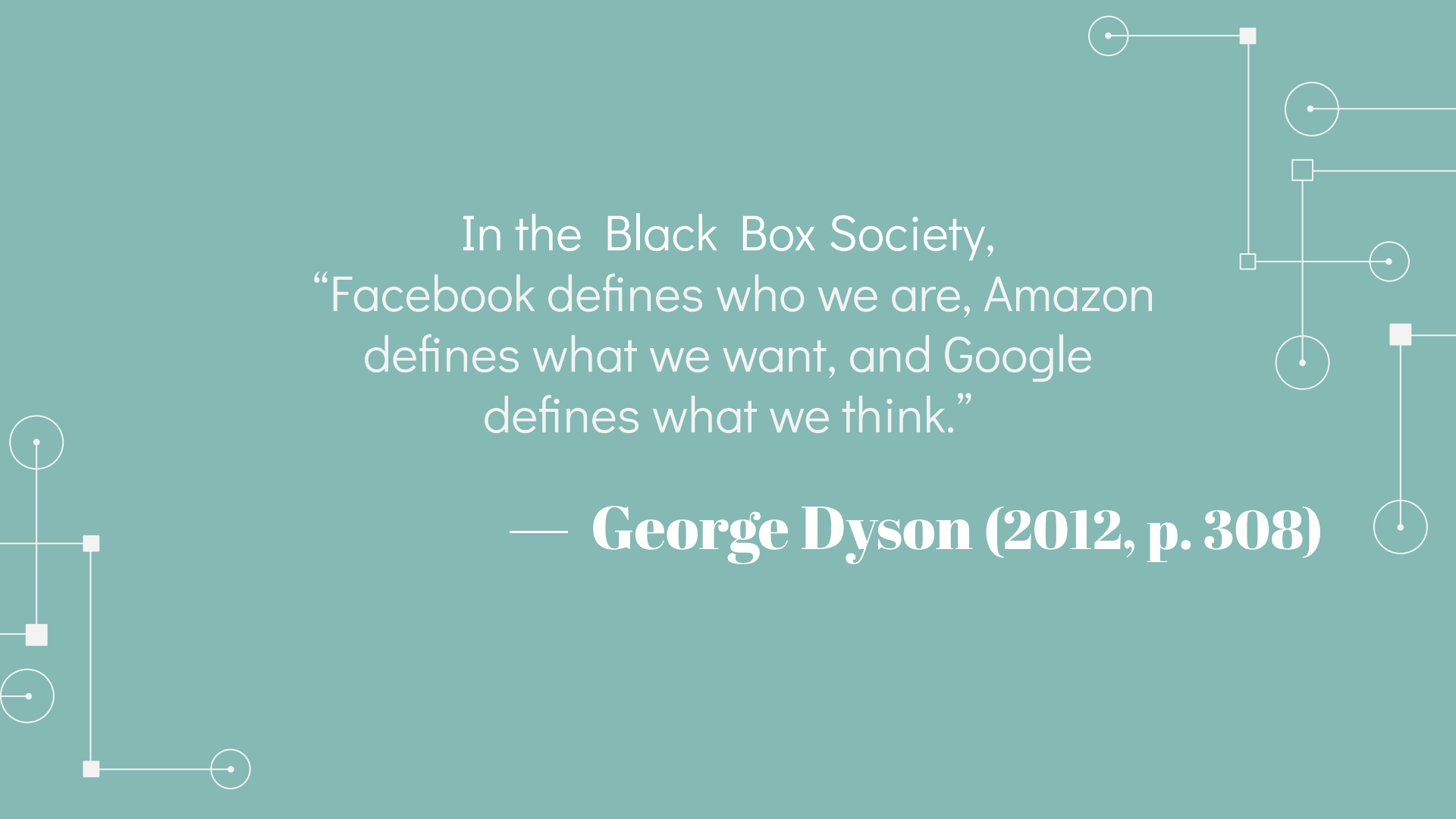
Algorithmic literacy in academic libraries

04.

Conclusion

Literacy as human right





In the Black Box Society,
“Facebook defines who we are, Amazon
defines what we want, and Google
defines what we think.”

— **George Dyson (2012, p. 308)**

Algorithms in action



Impact on elections

As a result of “vote prompt” on Facebook in 2010, 0.39% of users voted (Pasquale, 2016).



Racial profiling

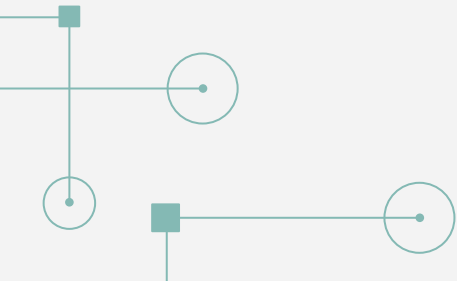
In 2019, it for was found that in the US hospitals referred for further help only 17% of black patients because of algorithms’ decision about high-risk categories based on cost.

(Obermeyer et al., 2019)



Resume-screening tool

The tool was built by Amazon based on decades worth of job applications by men, and therefore contained discrimination against women (Dastin, 2018)



Search algorithms



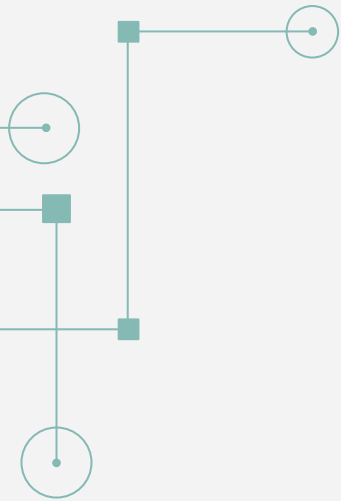
Search engine

Google filter bubbles, and a power to decide which population groups will see certain information online, and which will not (Kitchin, 2017).



Social media

Biases include homogeneity of Facebook's newsfeed, targeting content for specific group population, or algorithms blocking users for expressing certain views.



Problem

“Algorithmic power” becomes problematic due to its systemic bias, secrecy (proprietary nature of algorithms), and automation (Kitchin 2017; Pasquale, 2016).



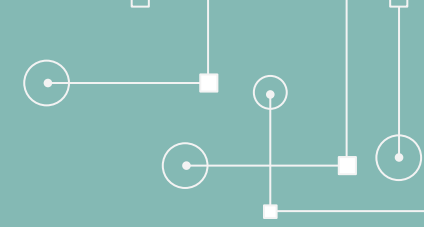
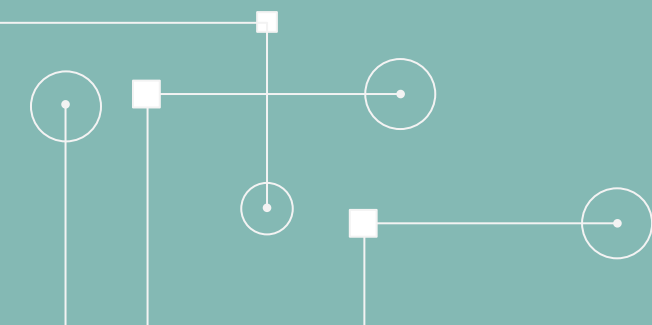
The “why”

We need to develop algorithmic awareness through algorithmic literacy interventions.

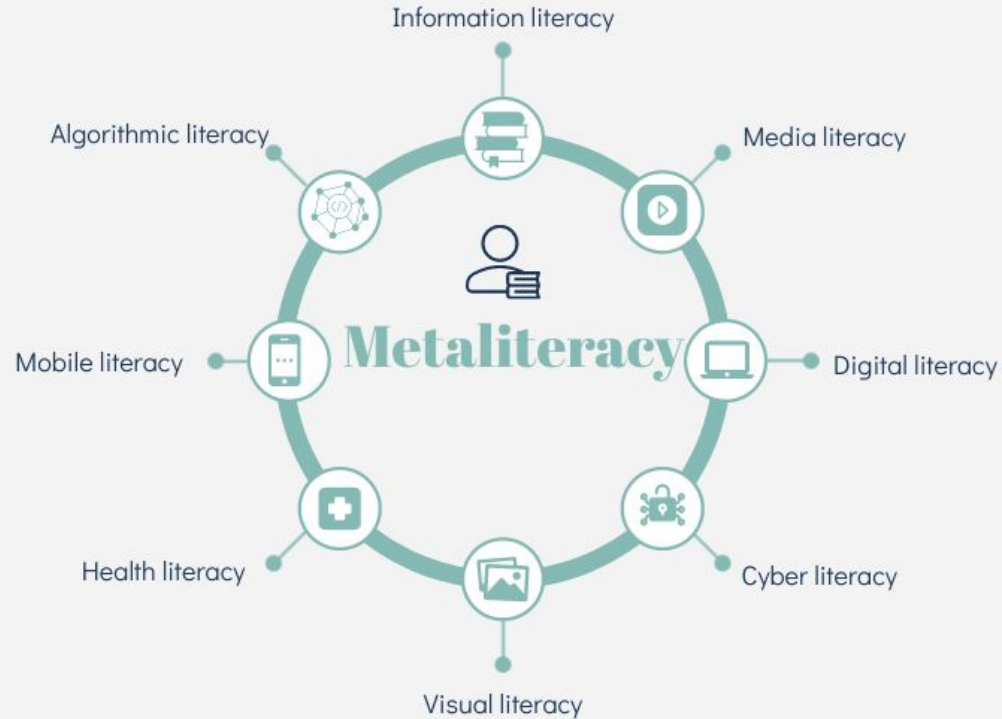
Metaliteracy

Role of algorithmic literacy in
digital and information literacies


01



Metaliteracy



(Based on Mackey & Jacobson, 2014)



**“Metaliteracy is not about introducing yet another literacy format, but rather reinventing an existing one - information literacy - the critical foundation literacy that informs many others while being flexible and adaptive enough to evolve and change over time”
(Mackey & Jacobson, 2014, p. 2)**

Metaliteracy

Traditional information skills

determine, access, locate, understand, and use information



Participatory digital environments

collaborate participate, produce, and share

(Mackey & Jacobson, 2014)

Metacognition

Allows students to “assess their own learning” and move beyond acquiring a specific skills to being able to integrate deep thinking and critically reflect about their own literacy

(Mackey & Jacobson, 2014)





02

Algorithmic literacy

Definition and issues



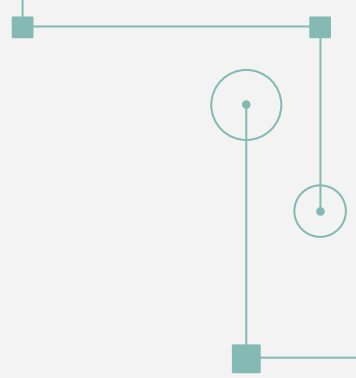
What is algorithmic literacy?

“Algorithm literacy can ... be defined as *being aware* of the use of algorithms in online applications, platforms, and services, *knowing* how algorithms work, being able to *critically evaluate* algorithmic decision-making as well as having the *skills to cope* with or even *influence* algorithmic operations”
(Dogruel et al., 2022, p. 118).

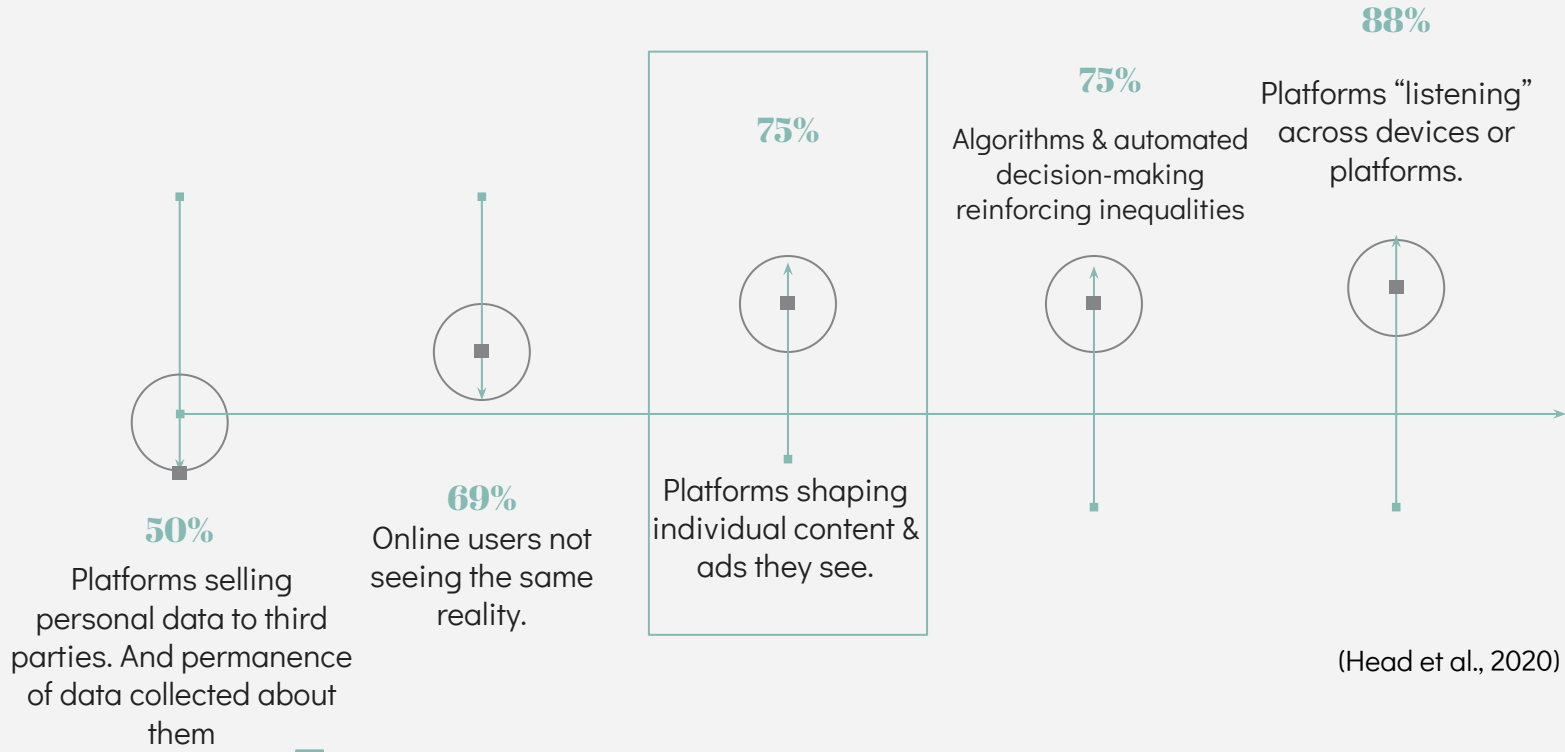




Students' views on algorithms

- Students are generally aware about the algorithms, but regard them as “part of the deal” (Head et al, 2020).
 - Students call for more support and understanding on how to protect their personal information (Brisson-Boivin & McAleese, 2021).
- 

Students' concerns about algorithms



(Head et al., 2020)



03

Teaching about algorithms

implementing algorithmic literacy in academic libraries

Opportunities for librarians



In-library



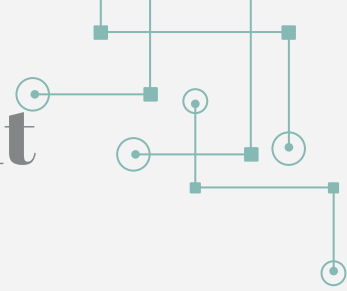
For-credit course



Embedded

Type of delivery	Special session, movie screening & discussions, (e.g. “Social dilemma”, “Coded bias”), reading clubs, self-pacing guides	Part of a curriculum (e.g. critical evaluation of sources)	Guest lecture (e.g. Social Communication program, Public Ethics)
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What does Google algorithm know about me?



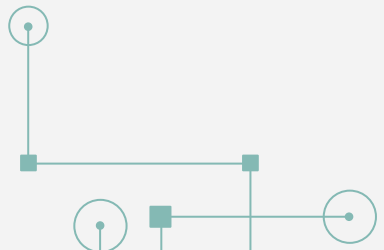
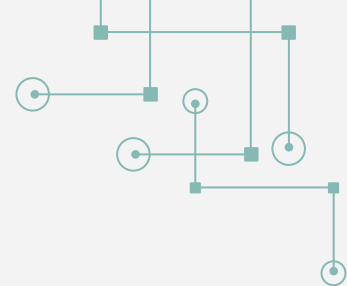
1. Watch a video about Echo Chambers.
2. Log in to your **Google account** on your phone or laptop.
3. Go to Manage your Google Account, click the Data & Privacy tab.
4. Scroll down to My Ad Center.
5. Scroll through the personal information Google has collected about you including your presumed age and gender, relationship status, household income, education level, industry, homeowner, parent.
6. How accurate is Google about you?
7. What information (e.g. ads.) would you “recommend” to someone with these characteristics?
8. Share your findings in the group.

(Adapted from Detmering et al., n.d.)



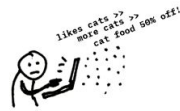
Let's go! Where have you come across AI recently?

Had a writing assignment graded by a computer	Seen a suggested response on Gmail to an email	Used a "safe search" on Google	Clicked on an Instagram ad	Used a fingerprint to unlock a device or app, or opened a device with your face
Used an online search engine like Google or Bing	Had a text auto-completed or used autocorrect	Had an email labelled as "important"	Seen news articles suggested in a news app	Sent a voice-to-text message on an app (e.g. Whatsapp)
Listened to a recommended song on Spotify	Got a weather forecast for a website or used a weather app	Seen a sponsored product on Google or Amazon, e.g. "since you bought... we thought you might like..."	Played a motion-sensitive video game, e.g. Mario Party, Nintendo, Wii U, etc.	Seen a recommended product on Facebook
Used a Snapchat filter	Seen a "nudge" reminder on Gmail to respond to an email	Seen a suggested ad on Snapchat	FREE	Used an app to recognise a song playing
Used a map app to find a path to a destination	Had an email go to your spam folder	Had an Emoji suggested instead of a word, e.g. "lol" is replaced by an Emoji smiley face	Seen a Google autofill search result	Communicated with a customer service bot (chatbot)



(dominicjorr, n.d.)
<https://glitch.com/~ai-bingo>

LIFE IN THE AGE OF Algorithms



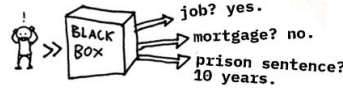
Platforms seek patterns in data to predict and influence behavior



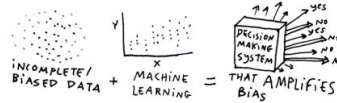
and personalize news and advertising, based on guesses about individual preferences



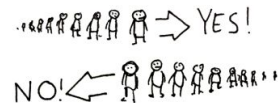
creating the potential for us to experience different realities



Our lives are increasingly influenced by decision-making systems that build on correlations



using "artificial intelligence" software that relies on incomplete data to make generalizations



and amplifies existing biases at large scale



Information systems we depend on are shaped by a tech culture marked by narrow perspectives and overconfidence



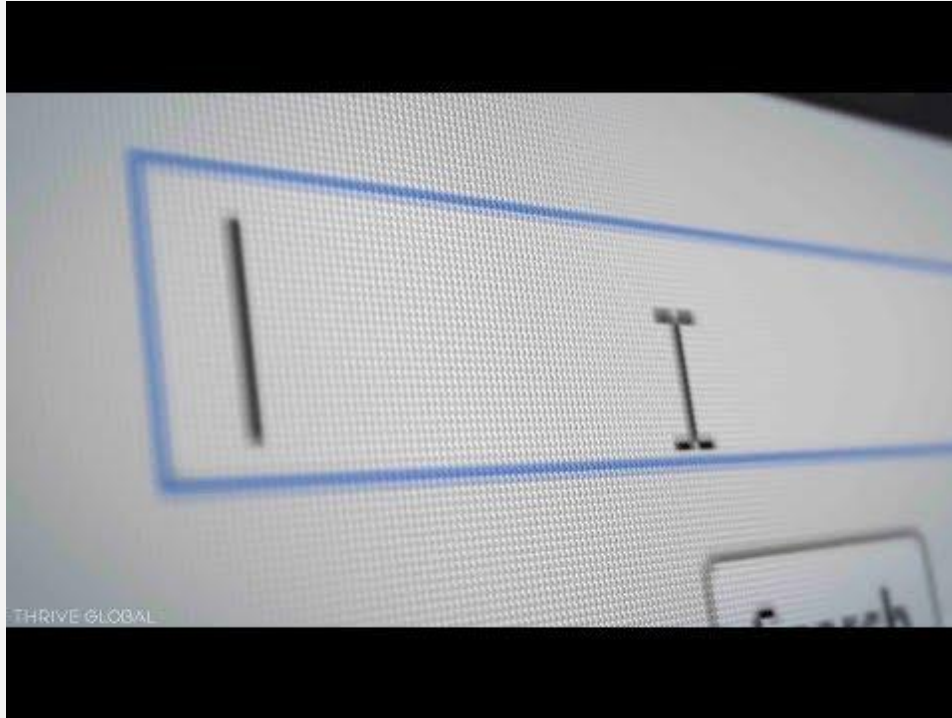
that rely on mining users' data and manipulating their behavior



in ways that undermine our trust in news, politics, and each other.

Jessica Yuzkofsky (2019)

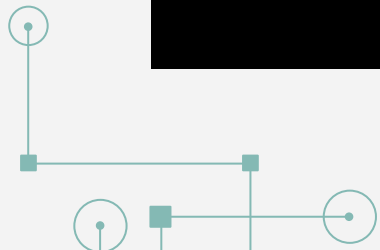
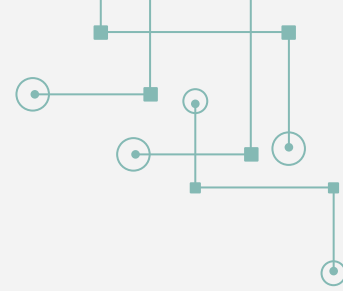
Watch a video with by Sofiya Umoja Noble, author of “Algorithms of Oppression”

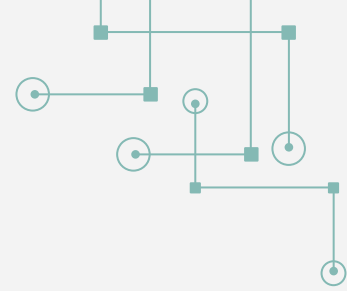


Discussion question:

- What effect of search algorithmic that Sofiya Noble discusses in the video have you experienced or heard about?
- What do you think of her claim that algorithmic bias will become a major human rights issue?

Adapted from Baer, 2021





Continue watching on Twitter

SEARCH ATLAS

Visualizing Divergent Search Results
Across Geopolitical Borders

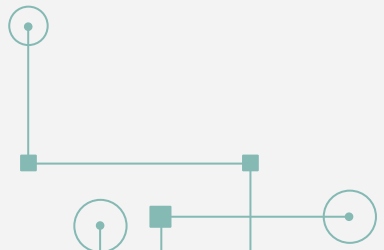
Katherine Ye* (Carnegie Mellon University) & Rodrigo Ochigame* (MIT)
(*equal contribution)

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Discussion question:

- How does the tool like Atlas can help us understand the role of algorithms in international conflict?

<https://searchatlas.org/>



Resources & activities:

<https://algorithmliteracy.org/>

- <https://chooseyourownfakenews.com/>
- <https://trackthis.link/>
- <https://mostlikelymachine.artefactgroup.com/>

AI Bingo

<https://unbias.wp.horizon.ac.uk/>

<https://weneedtotalk.ai/>

<https://library.louisville.edu/citizen-literacy/home>

https://guides.libraries.psu.edu/berks_algorithms

https://libguides.rowan.edu/algorithmic_bias

<https://www.commonsense.org/education> (K-12)

[Critical Algorithm Studies: a Reading List](#)



Conclusion

Information Literacy as human
right



**“Algorithms serve
as a gatekeepers
and arbiters of
truth online”**

(Cotter & Reisdorf, 2020, p. 745)

Algorithmic awareness



Critical thinking skills

identifying misinformation & disinformation, news consumption and propaganda and social media use

(Ahmad et al., 2022; Powers, 2017).



Identifying biases

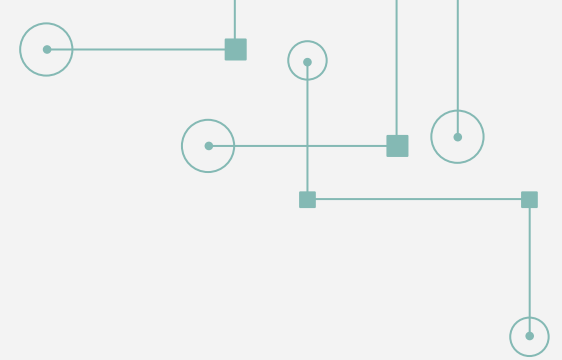
addressing misconceptions about algorithms, marginalization of certain groups, based on algorithms' recommendations

(Brodsky et al., 2020; O'Hara, 2021; Zarouali et al., 2021).



Digital citizenship

allows learners to be aware digital citizens as they navigate technological society today



Information literacy as human right

Information literacy as metaliteracy is a social responsibility and a human right (Saunders, 2017)





Thanks!

Do you have any questions?

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Template: Slidego

Icons: Flaticon

Images: Unsplash

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