Algorithms as Data: A Case Study for Turning Algorithmic User Experiences into Research Data Objects

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csv,conf,v6

What's Ahead

- Research Update
- Beyond Definition and Into Practice
- Algorithmic UX
- Algorithm audit techniques
- Research Implications

The Research

Institute of Museum and Library Services
Laura Bush 21st Century Librarian Program (LB21)

“RE:Search” - Unpacking the Algorithms That Shape Our UX

https://github.com/jasonclark/algorithmic-awareness

Practices of Algorithms

Documenting First Principles of Algorithms

Exercises in Writing Algorithms in Pseudocode

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Pedagogy for the Algorithm (META)

1. Frame with a material consequence.
2. Introduce “First Principle”, not math formula.
3. Demonstrate the algorithm in action.
4. Leave space for group to discuss.

Algorithm as Symptom

A ghost, something unseen

What if?

Algorithms weren't the Ghost in the Machine.

Algorithms were understood ***as*** part of the ***open data*** continuum.

The UX of Algorithms

masking
filtering
searching
ranking
natural language processing
parsing
counting
sorting
vectorizing

How do you quantify Algorithmic UX?

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Algorithms were under fire at a Senate hearing on social media

"Algorithms have great potential for good. They can also be misused."

TIM DE CHANT - 4/28/2021, 2:20 PM

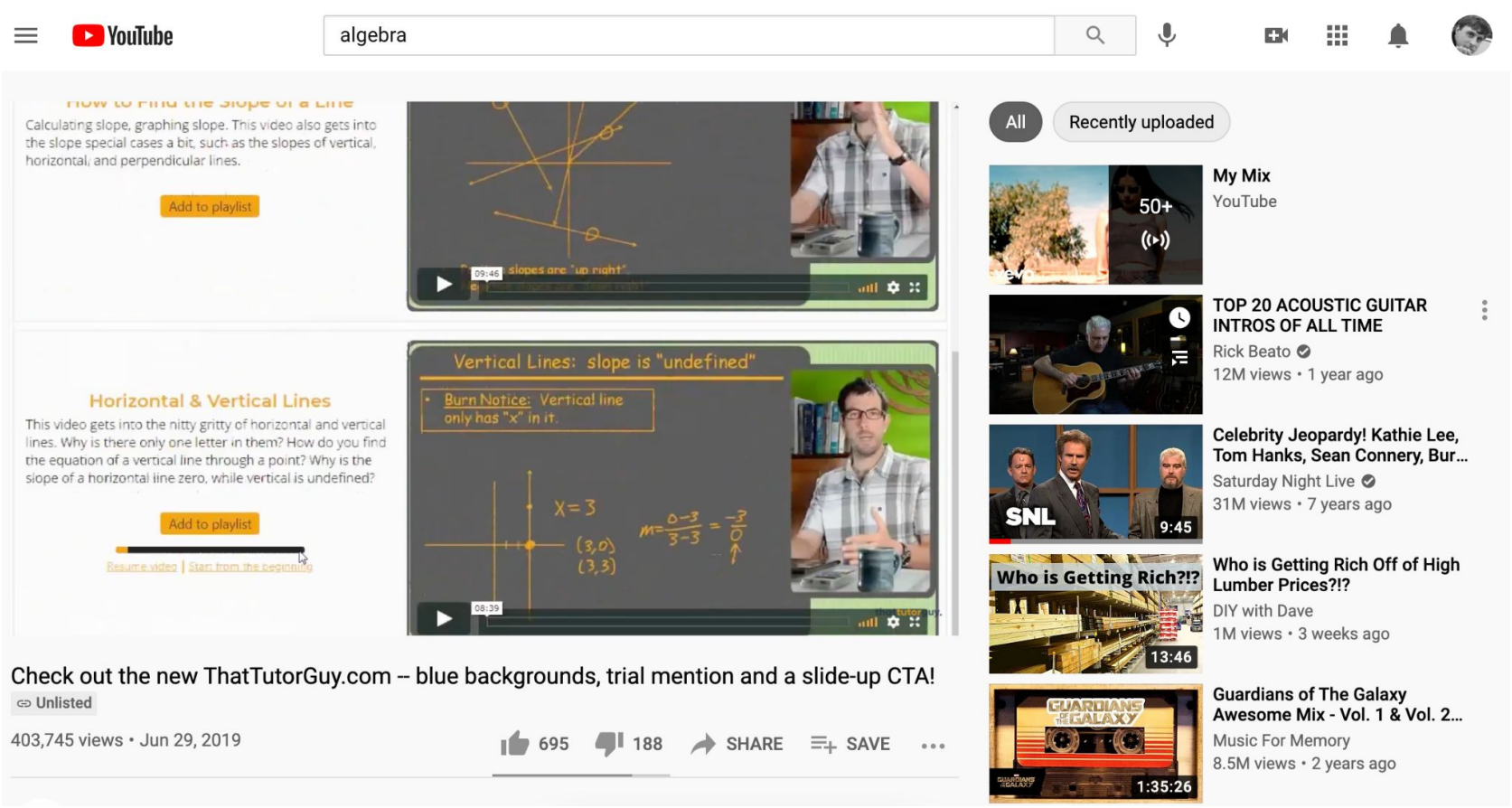
Al Drago-Pool/Getty Images

Enlarge / Chairman Senator Chris Coons (D-Del.) (right) speaks with Sen. Ben Sasse (R-Neb.) during a Senate Judiciary Subcommittee on Privacy, Technology, and the Law hearing April 27, 2021 on Capitol Hill in Washington, DC. The committee is hearing testimony on the effect social media companies' algorithms and design choices have on users and discourse.

Algorithms & Amplification - Subcommittee on Privacy, Technology, and the Law

At the 2018 CES conference, YouTube's chief product officer said the site's recommendation engine is responsible for more than 70% of users' time spent watching videos on the platform.

Source: Pew Research Analysis of YouTube Recommendation Algorithm



[Query for “algebra”](#)on YouTube

Auditing Algorithms
(Case Study)

Setting up software and scripting to understand and classify YouTube search recommendations.

Research Partners

- Marielle Korringa
- Julian Kaptanian
- Tyler Bass

Step One:

Simulating a User

Creating a user agent

Web scraping and harvesting

`webscraper.py`

Step Two:

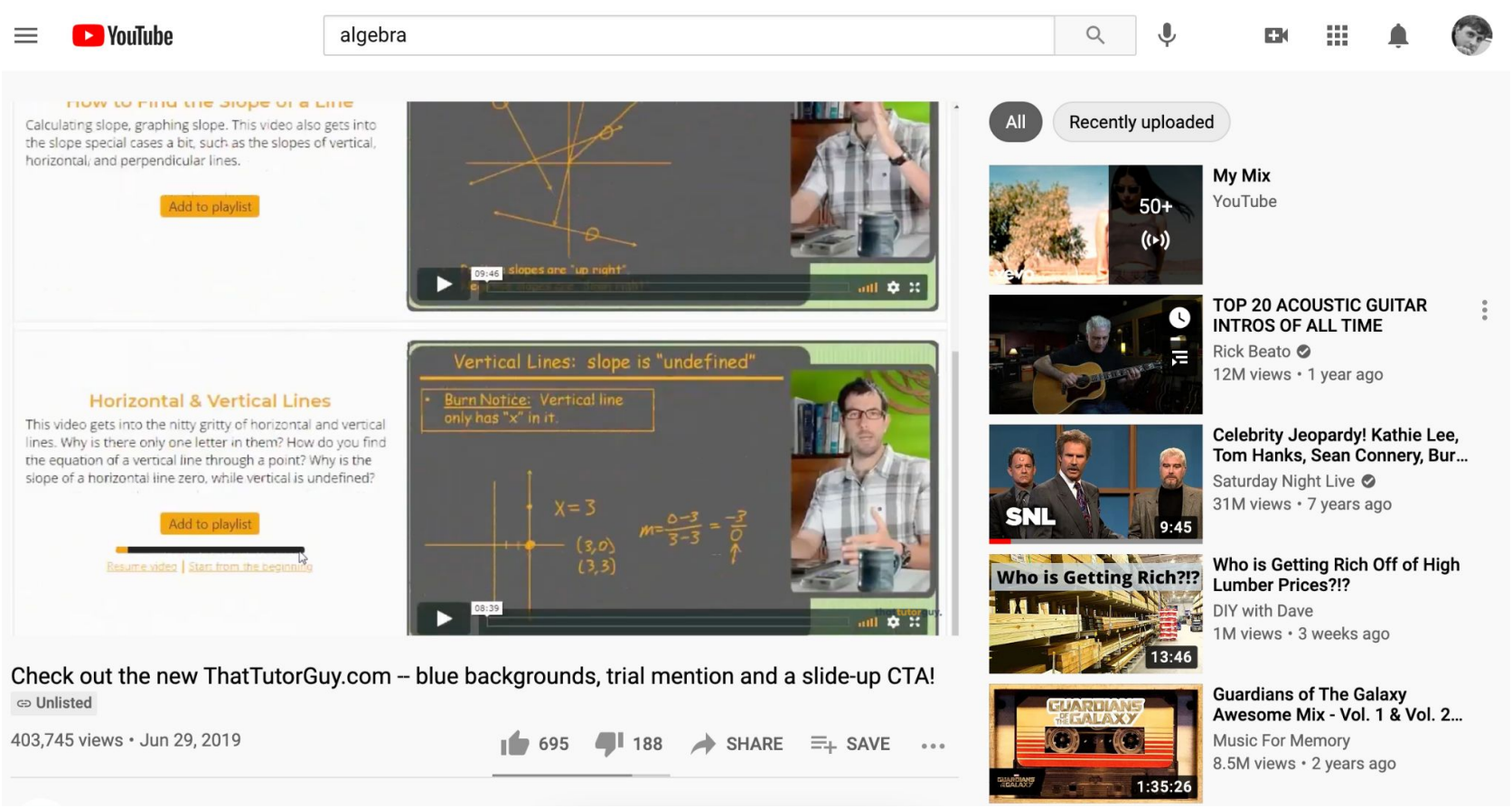
Analyzing results

Evaluating the recommendation.

What are the tells in a recommendation?

- ALL CAPS
- Excessive links in description
- Shift in content subject types

`analysis.py`



[Query for “algebra”](#)on YouTube

Step Three:

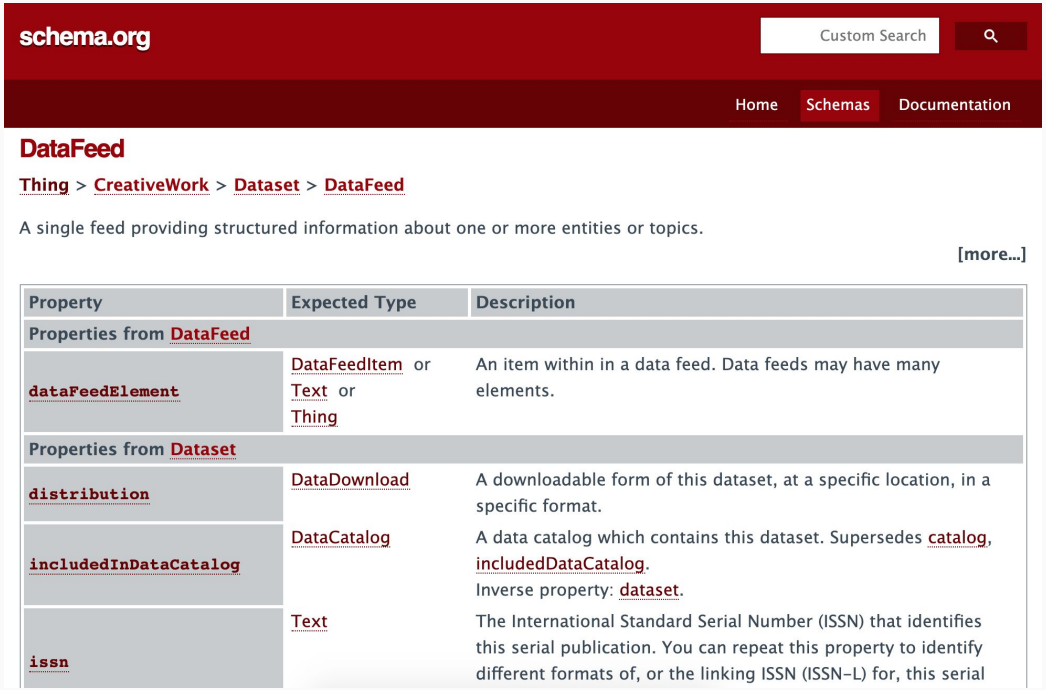
Packaging for Reuse

Creating structured data.

Encoding the analysis.

Setting up further analysis.

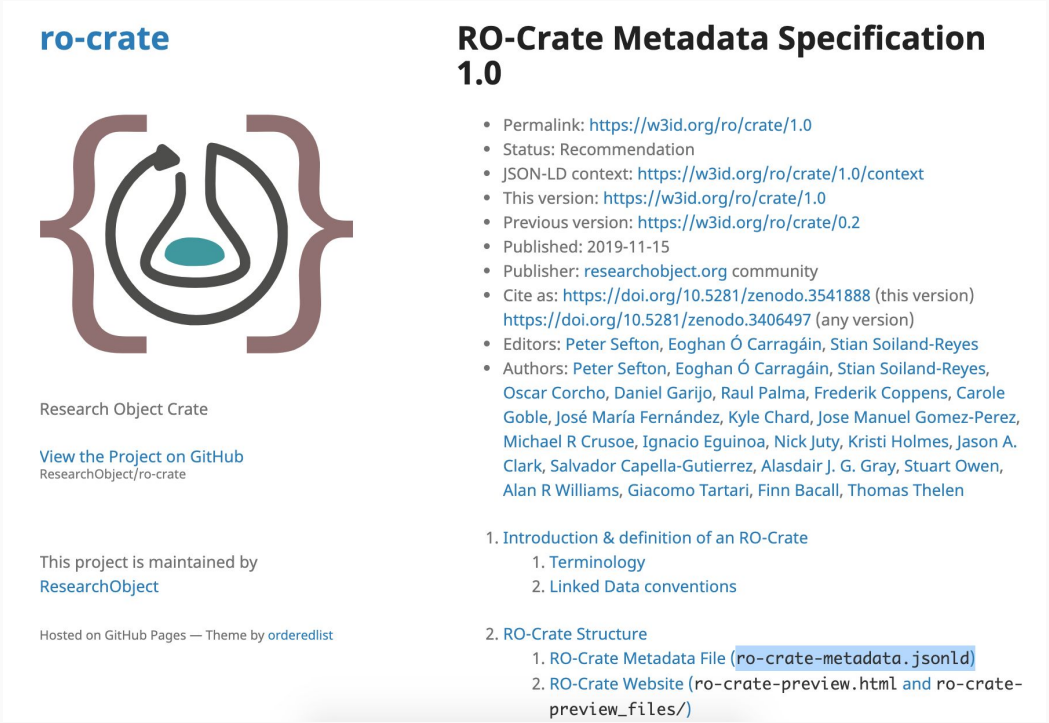
Standards - Schema.org



https://schema.org/Dataset

https://schema.org/DataFeed

Standards - Research Object Crate (RO-Crate)



a lightweight approach to packaging research data with their metadata

https://w3id.org/ro/crate/1.0

#digital-library-and-repository-content

Auditing an Algorithm (META)

1. Create a user agent and profile.
2. Map out your harvesting data points.
3. Collect and analyze the data.
4. Encode results in structured data for reuse.

Implications for Research Data Practice

Implications

Identifying algorithms as datasets.

Encoding algorithms as datasets.

Prioritizing hidden experiences.

Moving beyond naming and defining.

Auditing additional Algorithmic UX.
(Amazon, Instagram, TikTok, etc.)

Code Repository

Auditing tool

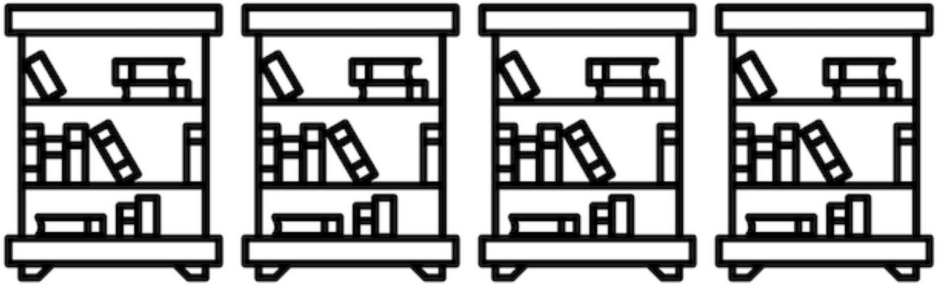
Algorithms in Search X-Ray app

Curriculum, Syllabus, Teaching Resources

Research Inspiration

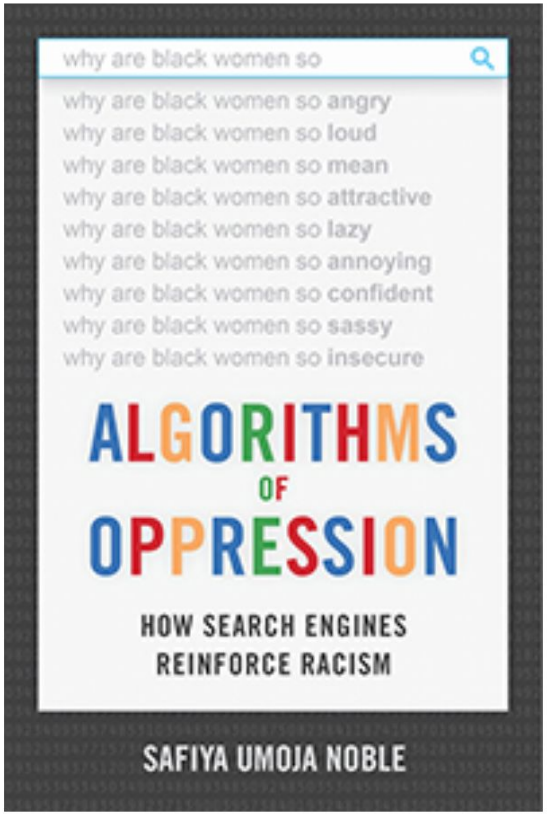
ALWAYS ALREADY COMPUTATIONAL - COLLECTIONS AS DATA

Always Already Computational



Thomas Padilla
Laurie Allen

CollectionsAsData



Algorithms of Oppression

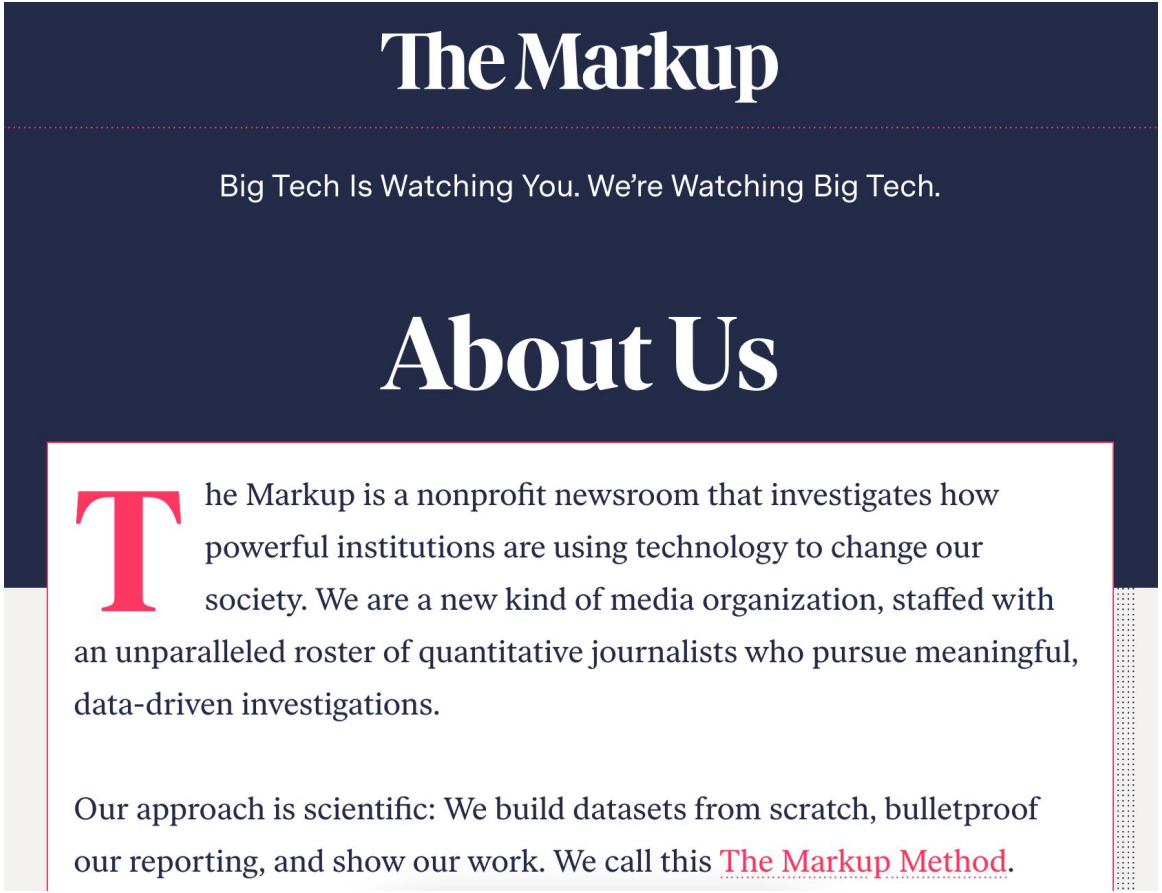
How Search Engines Reinforce Racism

Safiya Umoja Noble

256 pages
57 b/w photos
February, 2018
ISBN: 9781479837243

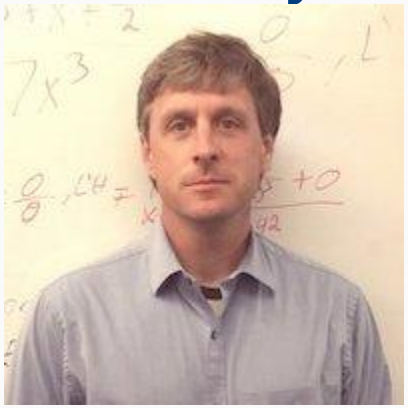
Table of Contents Introduction

https://safiyaunoble.com/



themarkup.org/about

Thank you



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References and Follow-up Resources

Critical Algorithm Studies - Social Media Collective
https://socialmediacollective.org/reading-lists/critical-algorithm-studies/

AlgoTransparency Manifesto
https://www.algotransparency.org/our-manifesto.html

The Bigot in the Machine - Barbara Fister
https://barbarafister.net/political/the-bigot-in-the-machine/

Information Literacy in the Age of Algorithms - Project Information Literacy
https://projectinfolit.org/pubs/algorithm-study/pil_algorithm-study_2020-01-15.pdf

Can Auditing Eliminate Bias from Algorithms? - Ask The Markup
https://themarkup.org/ask-the-markup/2021/02/23/can-auditing-eliminate-bias-from-algorithms

List of audit algorithms for getting insights from black-box algorithms - GitHub
https://github.com/erwanlemerrer/awesome-audit-algorithms