

# Algorithmic Bias: Where It Comes From and What to Do About It (Introduction)

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Andy Oram, Editor, O'Reilly Media

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# The Discoveries

Sweeney L.

Discrimination in Online Ad Delivery

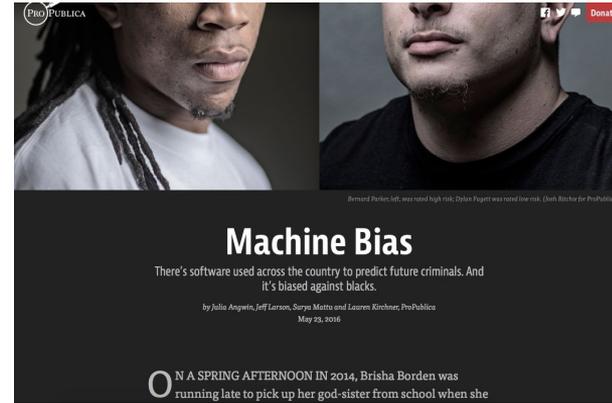
## Discrimination in Online Ad Delivery

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January 28, 2013<sup>1</sup>

### Abstract

A Google search for a person's name, such as "Trevon Jones", may yield a personalized ad for public records about Trevon that may be neutral, such as "Looking for Trevon Jones? ...", or may be suggestive of an arrest record, such as "Trevon Jones, Arrested?..." This writing investigates the delivery of these kinds of



[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2208240](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2208240)

<https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>

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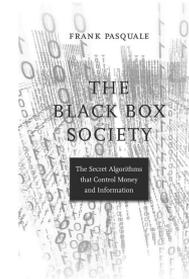
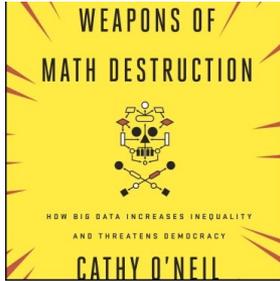
# The Hype



- <https://www.nytimes.com/2015/08/11/upshot/algorithms-and-bias-q-and-a-with-cynthia-dwork.html>
- <https://hbr.org/2013/04/the-hidden-biases-in-big-data>
- <https://www.theatlantic.com/technology/archive/2016/04/how-big-data-harms-poor-communities/477423/>
- <https://www.technologyreview.com/s/602933/how-to-hold-algorithms-accountable/>
- <https://www.brookings.edu/blog/techtank/2016/12/01/addressing-racial-bias-in-the-online-economy/>
- <http://www.pewinternet.org/2017/02/08/code-dependent-pros-and-cons-of-the-algorithm-age/>

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# The Books



<https://weaponsofmathdestructionbook.com/>

<http://www.hup.harvard.edu/catalog.php?isbn=9780674368279>

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# The Feds

Big Data: A Report on  
Algorithmic Systems,  
Opportunity, and Civil Rights

Executive Office of the President

May 2016



[https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016\\_0504\\_data\\_discrimination.pdf](https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf)

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# Association for Computing Machinery principles



Association for Computing Machinery  
US Public Policy Council (USACM)  
usacm.acm.org  
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January 12, 2017

## Statement on Algorithmic Transparency and Accountability

Computer algorithms are widely employed throughout our economy and society to make decisions that have far-reaching impacts, including their applications for education, access to credit, healthcare, and employment.<sup>1</sup> The ubiquity of algorithms in our everyday lives is an important reason to focus on addressing challenges associated with the design and technical aspects of algorithms and preventing bias from the onset.

An algorithm is a self-contained step-by-step set of operations that computers and other 'smart' devices carry out to perform calculation, data processing, and automated reasoning tasks. Increasingly, algorithms implement institutional decision-making based on analytics, which involves the discovery, interpretation, and communication of meaningful patterns in data. Especially valuable in areas rich with recorded information, analytics relies on the simultaneous application of statistics, computer programming, and operations research to quantify performance.

There is also growing evidence that some algorithms and analytics can be opaque, making it impossible to determine when their outputs may be biased or erroneous.

Computational models can be distorted as a result of biases contained in their input data and/or their algorithms. Decisions made by predictive algorithms can be opaque because of many factors, including technical (the algorithm may not lend itself to easy explanation), economic (the cost of providing transparency may be excessive, including the compromise of trade secrets), and social (revealing input may violate privacy expectations). Even well-engineered computer systems can result in unexplained outcomes or errors, either because they contain bugs or because the conditions of their use changes,

[https://www.acm.org/binaries/content/assets/public-policy/2017\\_usacm\\_statement\\_algorithms.pdf](https://www.acm.org/binaries/content/assets/public-policy/2017_usacm_statement_algorithms.pdf)

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# Questions addressed in this talk

- Why do algorithms discriminate?
- What is unfair bias?
- How can outsiders validate algorithms?
- Who is in control of the data?
- Where does free software play a role?
- How should we use algorithms, given these risks?

# The role of free software

MINORITY REPORTS

**Software used to predict crime can now be scoured for bias**



<https://qz.com/938635/a-predictive-policing-startup-released-all-its-code-so-it-can-be-scoured-for-bias/>

<https://github.com/CivicScapes> Algorithmic Bias — Andy Oram 

# Barriers to opening the source code

- Selfish actors might game the system
- Machine learning doesn't produce human-readable decision processes
- The devil often lies in the data
- Can't keep up with constant tweaks to the algorithms
- Trade secrets and other legal controls

# Barriers to using the source code if it's open

- How do you know at all if an algorithm is judging you?
- Who can understand the algorithms?
- The devil often lies in the data
- Power imbalances--do you dare to challenge the owner of the algorithm?

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with photo then  
send to back

## Two-line Title and content with smaller text

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    - Third line

# One-line title with side photo

- First line
  - Second line
    - Third line

Replace box  
with photo then  
send to back

Two-line title with side photo  
and content

- **First line**
  - Second line
    - Third line

Replace box with photo or photos

# One-line title with bottom photos

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  - Second line
    - Third line

Replace box with photo or photos

# Two-line title with content and bottom photos

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  - Second line
    - Third line

“Quote goes here”

# Section Header

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    - Third line

# One-line title with two side-by-side columns

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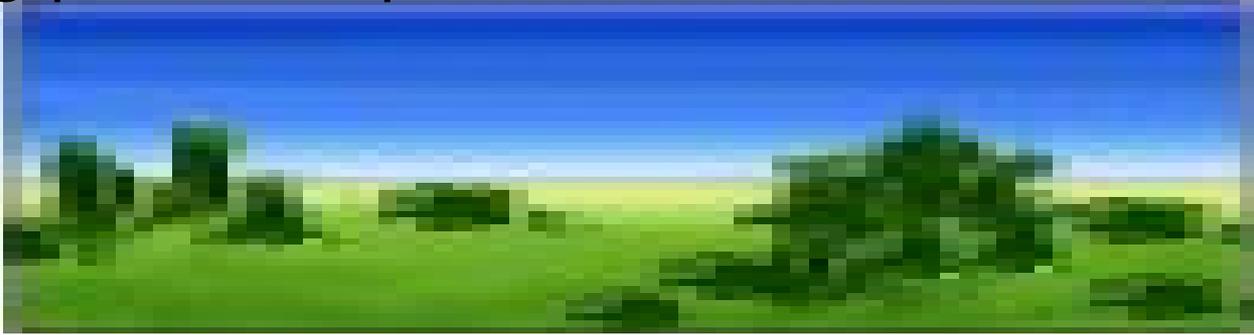
# One-line Title with Side-by-Side Comparison

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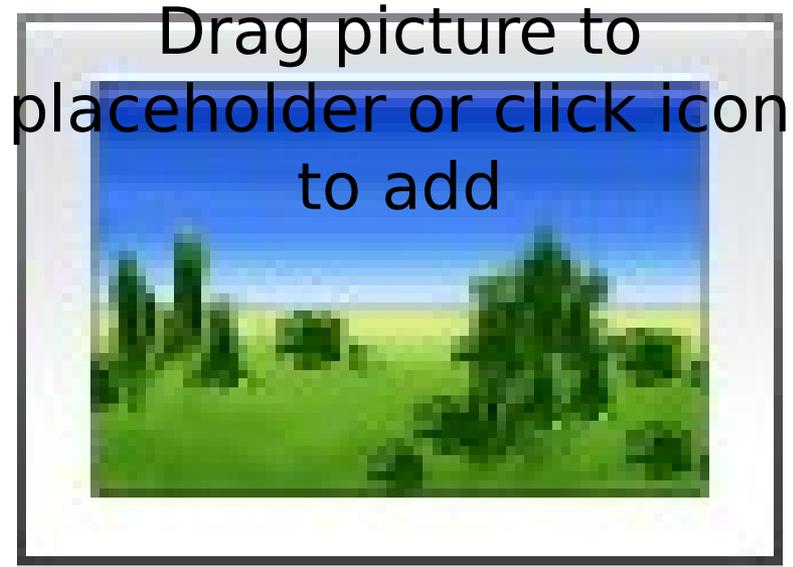
# Two-line Title with Side-by-Side Comparison



Drag picture to placeholder or click icon to add



# Photo Title



# Photo with text



# Title and content



Replace box with full bleed photo

# 1. Photo with text box



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