Racial and Gender Bias in Search Engines

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We would like to acknowledge that the University of North Carolina Wilmington is located on the traditional territory of the Catawba People and has long served as a site of meeting and exchange amongst many Indigenous peoples for over 12,000 years. We honor and respect the diverse Indigenous peoples connected to this territory that we now occupy, and what is now defined as the state of North Carolina, including the Coharie, Lumbee, Meherrin, Occoneechi Saponi, Haliwa Saponi, Waccamaw Siouan, Sappony, and the Eastern Band of Cherokee. This land acknowledgment is to pay respect and honor the elders of the Indigenous People and Nations both past and present. Please take a moment to consider the many legacies of violence, displacement, migration, and settlement that bring us together here today (USDAC, n.d.).

https://uncw.edu/diversity/land-acknowledgement.html
Outline

● Some basic definitions
● Search neutrality
● What we believe about search
● Examples of bias
● Examples of bias in library discovery
● Conclusion
What is Bias?
Dictionary

Definitions from Oxford Languages · Learn more

Search for a word

bi-as

/ˈbiːəs/

See definitions in:

All  Statistics  Bowls  Electronics  Needlework

noun

1. prejudice in favor of or against one thing, person, or group compared with another, usually in a way considered to be unfair.
   "there was evidence of bias against foreign applicants"

   Similar: prejudice  partiality  partisanship  favoritism  unfairness

2. in some sports, such as lawn bowling, the irregular shape given to a ball.

verb

1. cause to feel or show inclination or prejudice for or against someone or something.
   "all too often, our recruitment processes are biased toward younger candidates"

   Similar: prejudice  influence  color  sway  weight  predispose  distort

2. ELECTRONICS
   give a bias to.
   "bias the ball"
Algorithms and Mathematical Models
algorithm noun

al·go·rithm | 'al-gə-, ri-thəm

Definition of algorithm

: a procedure for solving a mathematical problem (as of finding the greatest common divisor) in a finite number of steps that frequently involves repetition of an operation broadly: a step-by-step procedure for solving a problem or accomplishing some end

// There are several search engines, with Google, Yahoo and Bing being the biggest players. Each search engine has its own proprietary computation (called an "algorithm") that ranks websites for each keyword or combination of keywords.
— Julie Brinton

// ... sometimes you solve a problem by coming up with an algorithm of some kind. But sometimes you solve a problem in a very ad hoc sort of way.
— William H. Huggins
mathematical model

mathematical model, either a physical representation of mathematical concepts or a mathematical representation of reality.
AI and Machine Learning
Artificial intelligence defined

Artificial intelligence is a field of science concerned with building computers and machines that can reason, learn, and act in such a way that would normally require human intelligence or that involves data whose scale exceeds what humans can analyze.

AI is a broad field that encompasses many different disciplines, including computer science, data analytics and statistics, hardware and software engineering, linguistics, neuroscience, and even philosophy and psychology.

On an operational level for business use, AI is a set of technologies that are based primarily on machine learning and deep learning, used for data analytics, predictions and forecasting, object categorization, natural language processing, recommendations, intelligent data retrieval, and more.
Dictionary
Definitions from Oxford Languages · Learn more

machine learning

noun
the use and development of computer systems that are able to learn and adapt without following explicit instructions, by using algorithms and statistical models to analyze and draw inferences from patterns in data.  "the application of machine learning to biological databases has increased"
The Idea of Search Neutrality
How our business works

Ads help fund our products
Our mission to organize the world’s information and make it universally accessible and useful has always been core to everything we do at Google. It’s why we make so many of our products, like Search, Maps, and Gmail, accessible and free of charge to everyone.

Advertising is what makes it possible to offer our products to everyone. While we sell things like Pixel phones, apps on the Play Store, YouTube subscriptions, and tools for businesses, we make the vast majority of our money from advertising.

So how does advertising at Google work? We make money selling ad space to businesses – big and small, global and local – in two key ways. First, businesses can reach potential customers by showing ads on a range of Google products such as Search, Maps, and YouTube.

Second, businesses can buy ad space that we show on sites and apps that partner with us, like news publications and blogs. In this case, most of the money goes to the partner and helps fund their content. So ads not only help support Google but also many other websites and creators.

Ultimately, we earn most of our money by showing ads alongside relevant Search results on Google.com. If you’re interested in learning more about how we make money, check out our Economic Impact report.
We have always believed it’s important for everyone to have free access to the best information. Ads enable Google to provide a free Search engine — one that works just as well for anyone, regardless of education or income.

We work hard to display ads only when they are relevant to the task you are trying to achieve on Google. We only charge advertisers when users interact with the ad, so our interest is in showing only useful ads. In fact, we frequently run no ads at all.

We have always believed it’s important for everyone -- regardless of income or education -- to have access to the best information, and ads help us do that.

While advertisers can pay and be displayed in clearly marked ad sections, no one can buy better placement in the Search results.
We only sell ads, not search results

When you use Google Search, ads may appear with your search results. We think it’s important to be transparent about these, which is why ads are clearly labeled, so they are easy to distinguish from the rest of the page.

Advertisers, partners or anyone with a financial relationship with Google gains no special advantages or treatment in Search results. They are not given ranking boosts. If they have issues, they must use the same free tools and resources that we provide to everyone.
Deliver the most relevant and reliable information available

Every day, fifteen percent of searches are ones we haven't seen before, so we use automated systems to get you the most relevant and reliable information we can find. To help you find what you're looking for, these systems consider many factors, including the words in your query, the content of pages, the expertise of sources, and your language and location. To measure whether people continue to find our results relevant and reliable, we have a rigorous process that involves extensive testing and the use of quality raters who ensure our automated systems produce great results as a human would expect.

Learn more
383,605 search quality tests

We work with external Search Quality Raters to measure the quality of Search results on an ongoing basis. Raters assess how well content fulfills a search request, and evaluate the quality of results based on the expertise, authoritativeness, and trustworthiness of the content. These ratings do not directly impact ranking, but they do help us benchmark the quality of our results and make sure these meet a high bar all around the world.

Raters assess how well a website gives people who click on it what they are looking for, and evaluate the quality of results based on the expertise, authoritativeness, and trustworthiness of the content.

To ensure a consistent approach, we publish Search Quality Rater Guidelines to give these Raters guidance and examples for appropriate ratings. While evaluating the quality of results might sound simple, there are many tricky cases to think through, so this feedback is critical to ensuring we maintain high quality results for users.
How results are automatically generated

With the vast amount of information available, finding what you need would be nearly impossible without some help sorting through it. Google’s ranking systems are designed to do just that: sort through hundreds of billions of webpages and other content in our Search index to present the most relevant, useful results in a fraction of a second.

Key factors in your results

To give you the most useful information, Search algorithms look at many factors and signals, including the words of your query, relevance and usability of pages, expertise of sources, and your location and settings. The weight applied to each factor varies depending on the nature of your query. For example, the freshness of the content plays a bigger role in answering queries about current news topics than it does about dictionary definitions.
Why problematic content may appear

Since Search encompasses trillions of pages across the web, occasionally results may contain content that some find objectionable or offensive. This may especially happen if the language used in a search query matches closely with the language that appears within problematic content. It might also happen in situations where fairly little useful or reliable content has been published that aligns with a particular topic. Such problematic content does not reflect Google’s own opinions. However, our belief in open access to information means that we do not remove such content except in accordance with the specific policies or legal obligations.

No system is 100% perfect. If our process surfaces policy-violating content, we always look to resolve it by improving our automated systems. This allows us to better deal with both a particular issue that’s been detected and improve for related queries and other searches overall.

In some cases, we may also take manual action. This does not mean that Google uses human curation to rearrange the results on a page. Instead, humans are used to review cases where policy-violating content surfaces and take manual action to block this content, in the limited and well-defined situations that warrant this.
Policies for Web results versus Search features

Web results are web pages, images, videos, news content or other material that Google finds from across the web. In keeping with our commitment to maximize access to information, we do not remove web results except for specific reasons covered by our overall content policies for Google Search, which includes child sexual abuse, highly personal information, spam, site owner requests and valid legal requests.

Search features include panels, carousels, enhancements to web listings (such as through structured data), predictive and refinement features, and results and features spoken aloud. Even though these features and the listings within them are automatically generated as with web results, we understand that people might perceive these to have higher credibility because of how they’re presented. We also don’t want predictive or refinement features to unexpectedly shock or offend people. This is why we have Search features policies that cover a variety of issues, including barring harassing, hateful and violent content. In addition to these, some Search features have more specific policies.
How we handle issues with predictions

Autocomplete predictions aren’t perfect. There’s the potential for unexpected or shocking predictions to appear. Predictions aren't assertions of facts or opinions, but in some cases, they might be perceived as such. Occasionally, some predictions might be less likely to lead to reliable content. Here’s how we deal with issues like these.

First, autocomplete has systems designed to prevent potentially unhelpful and policy-violating predictions from appearing. These systems try to identify predictions that are violent, sexually explicit, hateful, disparaging, or dangerous, or which lead to such content. This includes predictions that are unlikely to return much reliable content, such as unconfirmed rumors after a news event.

Second, if the automated systems don’t catch problematic predictions, our enforcement teams remove those that violate our policies. In these cases, we remove the specific prediction in question and closely-related variations.

These systems help ensure that autocomplete doesn’t unintentionally shock or surprise people with predictions they might not expect. While they might prevent some predictions from appearing, autocomplete doesn’t prevent anyone from completely typing out a search query to get results, if they wish.
Autocomplete also has these feature-specific policies:

- **Elections-related predictions:** We don’t allow predictions that can be interpreted as:
  - A position for or against any political figure or party, or
  - A claim about the participation in or integrity of the electoral process.
- **Health-related predictions:** We don’t allow predictions about potentially medically hazardous health claims.
- **Sensitive and disparaging terms associated with named individuals:** We don’t allow predictions that associate potentially disparaging or sensitive terms with named individuals. This include predictions that:
  - May be related to harassment, bullying, threats, inappropriate sexualization, or
  - Expose private or sensitive information in a way that may cause harassment, identity theft or financial fraud.

We may make exceptions to these policies when the prediction has context related to artistic, educational, historical, documentary, or scientific content, or content that helps to further understanding and participation in current events and issues related to our society, politics, culture, and economy.

Accessed 4/5/2022 from [https://support.google.com/websearch/answer/7368877#zippy=%2Cautocomplete-policies](https://support.google.com/websearch/answer/7368877#zippy=%2Cautocomplete-policies)
Autocomplete policies

To help ensure autocomplete is a helpful experience for everyone, we have systems in place to prevent predictions that are in violation of Google Search’s overall policies or these policies for Search features:

- Dangerous content
- Harassing content
- Hateful content
- Sexually explicit content
- Terrorist content
- Violence and gore
- Vulgar language and profanity

Learn more about these Content policies for Google Search.

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  - May be related to harassment, bullying, threats, inappropriate sexualization, or
  - Expose private or sensitive information in a way that may cause harassment, identity theft or financial fraud.

- **Serious malevolent acts**: We don’t allow predictions that can be interpreted as accusations against individuals or groups of serious malevolent acts, where there is a lack of well-established or expert supporting evidence.

We may make exceptions to these policies when the prediction has context related to artistic, educational, historical, documentary, or scientific content, or content that helps to further understanding and participation in current events and issues related to our society, politics, culture, and economy.
What Do We Believe About Search? How Do We Use It?
In 2002:

- 52% of all Americans used search engines.

In 2012:

- 73% of all Americans used search engines
- 91% of search engine users say they always or most of the time find the information they are seeking when they use search engines
- 73% of search engine users say that most or all the information they find as they use search engines is accurate and trustworthy
- 66% of search engine users say search engines are a fair and unbiased source of information
- 55% of search engine users say that, in their experience, the quality of search results is getting better over time, while just 4% say it has gotten worse
- 52% of search engine users say search engine results have gotten more relevant and useful over time, while just 7% report that results have gotten less relevant

https://www.pewresearch.org/internet/2012/03/09/search-engine-use-2012/
We are confident in our search abilities:

“More than half of search users (56%) say they are very confident in their search abilities, while only 6% say they are not too or not all confident. And the vast majority of search users report being able to find what they are looking for always (29%) or most of the time (62%).”

Users said they had:

- learned something new or important that really helped them or increased their knowledge (86% of search users have had this experience)
- found a really obscure fact or piece of information they thought they would not be able to find (50%)
- gotten conflicting information in search results and not been able to figure out what is correct (41%)
- gotten so much information in a set of results that you feel overwhelmed (38%)
- found that critical information is missing from search results (34%)
Proponents of algorithms often argue that these systems can lead to fairer and more effective decision-making, but others worry that these processes will simply reinforce existing biases and disparities. When asked for their own views on this subject, nearly six-in-ten Americans (58%) think computer programs will always reflect the biases of their designers, while 40% believe it is possible for computer programs to make decisions that are free from human bias.
Examples of Bias
2015: Google Photo’s autotagging feature tags photos of two Black people as “gorillas”

- Neural networks
- Learning algorithm
- Historical data sets
- “Better recognition of dark-skinned faces”
Take authentic, accurate portraits with Real Tone.™

Portraits on Pixel represent the nuances of different skin tones for all people beautifully and authentically.
Google’s Photo App Still Can’t Find Gorillas. And Neither Can Apple’s.

Eight years after a controversy over Black people being mislabeled as gorillas by image analysis software — and despite big advances in computer vision — tech giants still fear repeating the mistake.

U.S. News & World Report College Rankings

- Proxies
- Feedback Loop
- Scale
Is This the Beginning of the End of the ‘U.S. News’ Rankings’ Dominance?
● New Jim Code
● Just a glitch?
● Malcolm Ten Boulevard
● Three Black teenagers
2005: Google publishes “An Explanation of Our Search Results”

2012: Google includes a box with a link to the explanation on the bottom of the search results page for “Jew”

2022: No antisemitic search results are on the first page of results for the same search. The explanation page is not linked and no longer accessible from the same URL.
Trans Researchers Want Google Scholar to Stop Deadnaming Them

The academic search engine’s policy on name changes is out of step with other search tools and publishers.
How Google’s Autocomplete Predictions Encouraged Transphobic Searches

We documented hundreds of cases of the search engine making transphobic suggestions.

BY JD SHADEL
April 7, 2022
There’s More to AI Bias Than Biased Data, NIST Report Highlights

Rooting out bias in artificial intelligence will require addressing human and systemic biases as well.

March 16, 2022
Microsoft's new AI chatbot has been saying some 'crazy and unhinged things'

March 2, 2023 • 5:01 AM ET

BOBBY ALLYN
Examples of Bias in Library Discovery Systems
Summon Topic Explorer and EBSCO Discovery Service Research Starter return factually incorrect and biased results.

- Donald Trump and Barack Obama
- Rape Culture and Rape Myths
- Muslim terrorist in the United States
- 9/11 vs. September 11 vs. September 11th
Conclusion
Apple, Google and other tech companies work together in diversity push

Netflix and Twitter are also among those that have signed on.

Sean Keane
Oct. 28, 2021 7:00 a.m. PT
References and Resources


Questions?

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