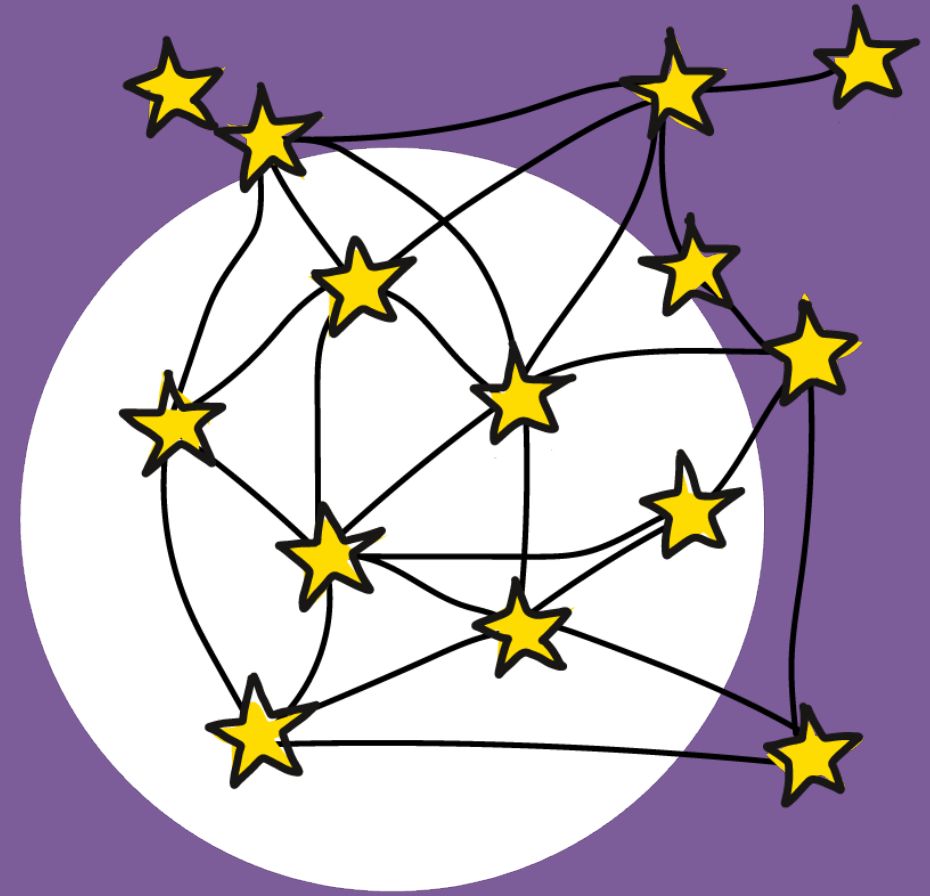


Dystopia vs Utopia

A hands-on workshop on ethical aspects of web search

OSF Working Group Ethics



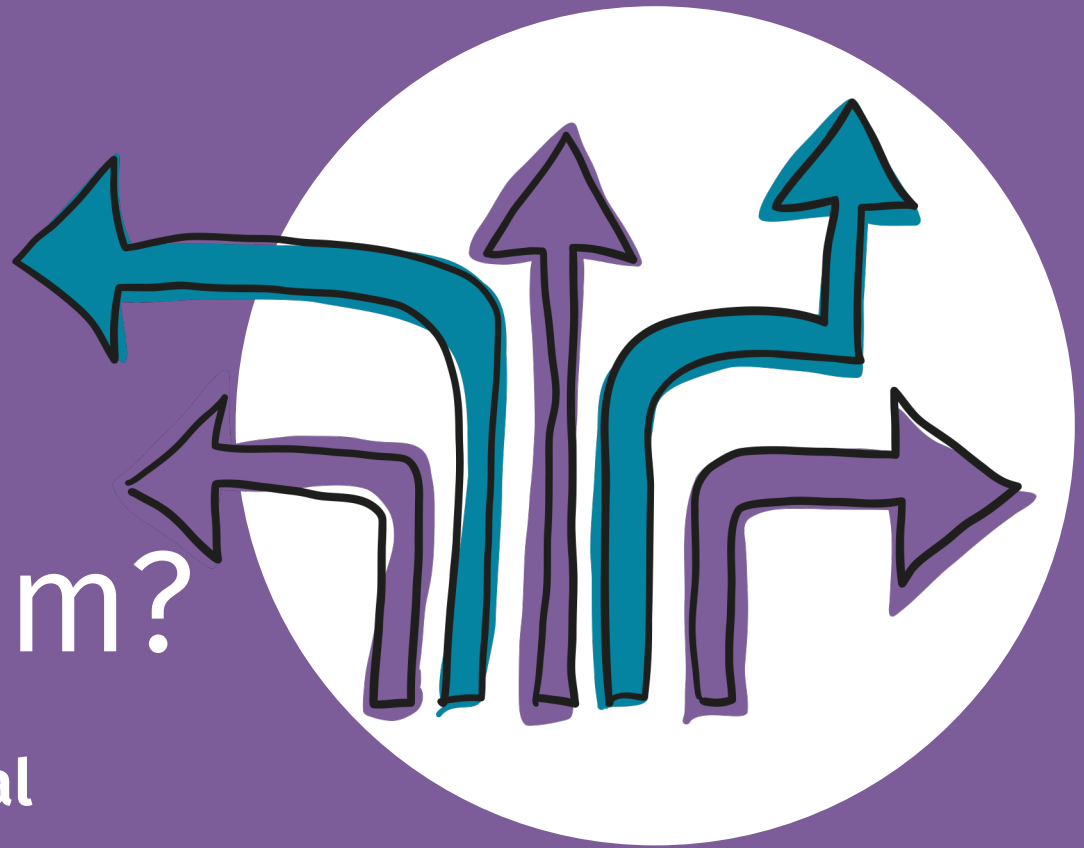
open search
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Workshop plan

1. Impulse – Christine Plote and Jasmin Tietgen [15 min]
2. Group Work – all [15 to 20 min]
3. Presentation of ethical values – OSF Working Group Ethics [10 min]
4. Group Work – all [10 min]
Presentation of group work results – all [5 min]
5. Group Work – all [20 min]
6. Presentation of results + wrap-up [5 min]

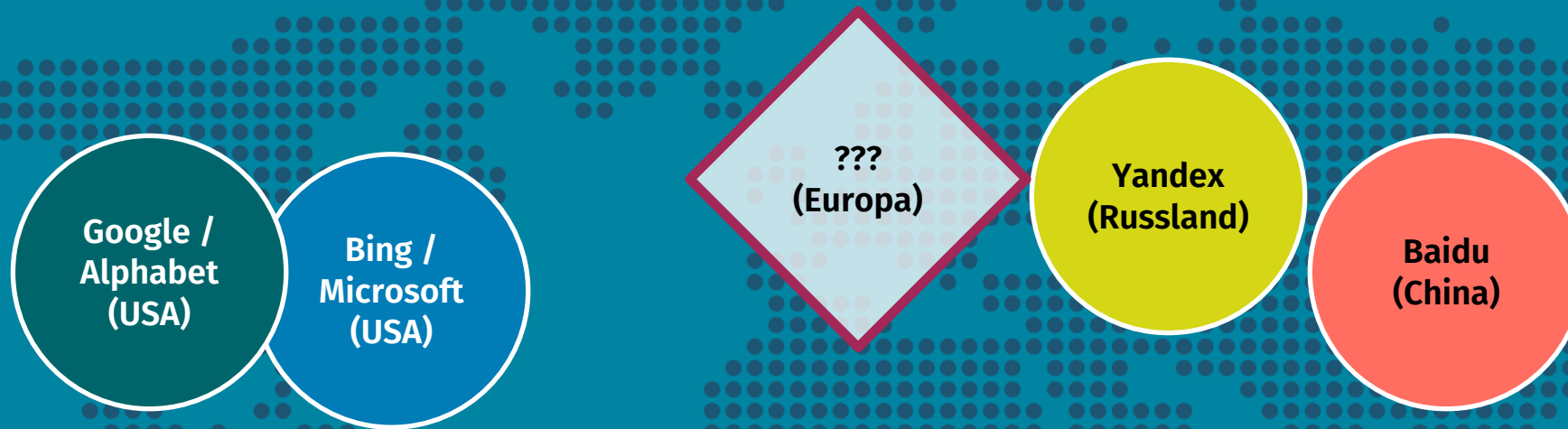
Web search? Ethics? What's the problem?

Impulse: 8 everyday examples of ethical problems in web search



1. Dependency: Monopolist Structures

Why there is de facto only one search engine



- No (fast) internet search without an index
- Worldwide, there are only four relevant search engines with their own search index. Outside China and Russia, only one: Google.
- Worldwide, around **85 per cent** of all searches go through Google.
- Alternative search engines use the index of Google or Bing.
- We are dependent on a search engine monopoly.

2.

Privacy:

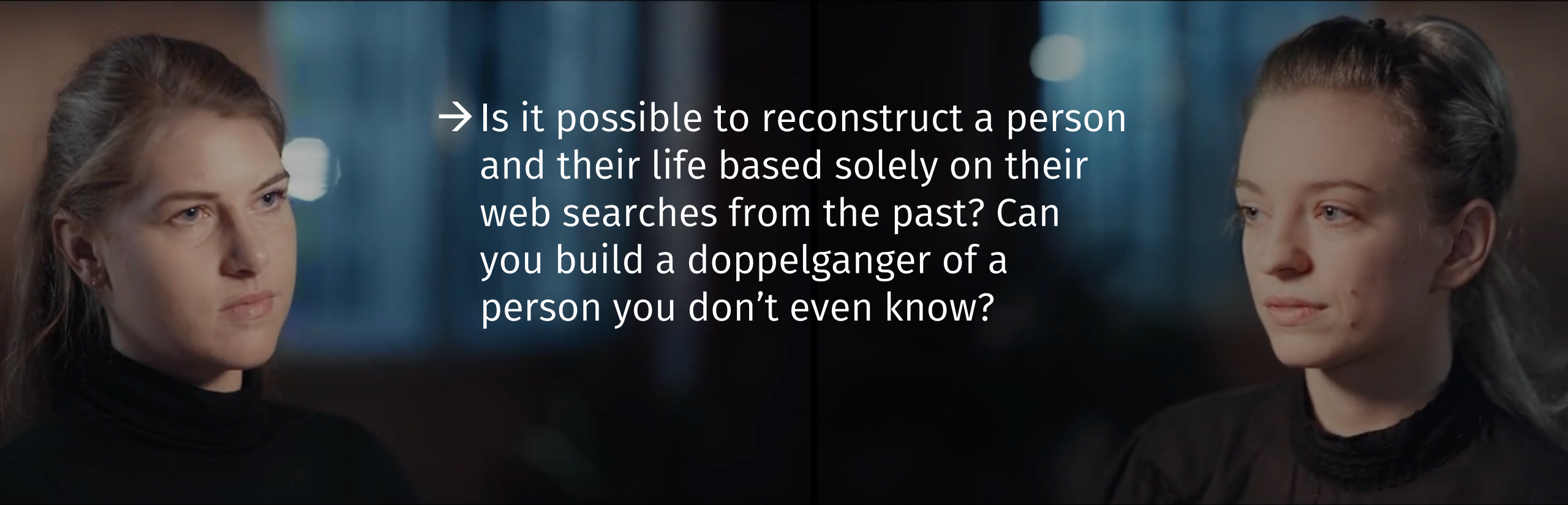
Tracking + digital surveillance

"There's no one you're more honest with than the Google search box."

Constanze Kurz
Computer scientist, author,
spokesperson for the
Chaos Computer Club

We trust search engines with our most personal questions and secrets. – Even though we don't know how they work, what algorithms they use to serve us results or what they do with that information.

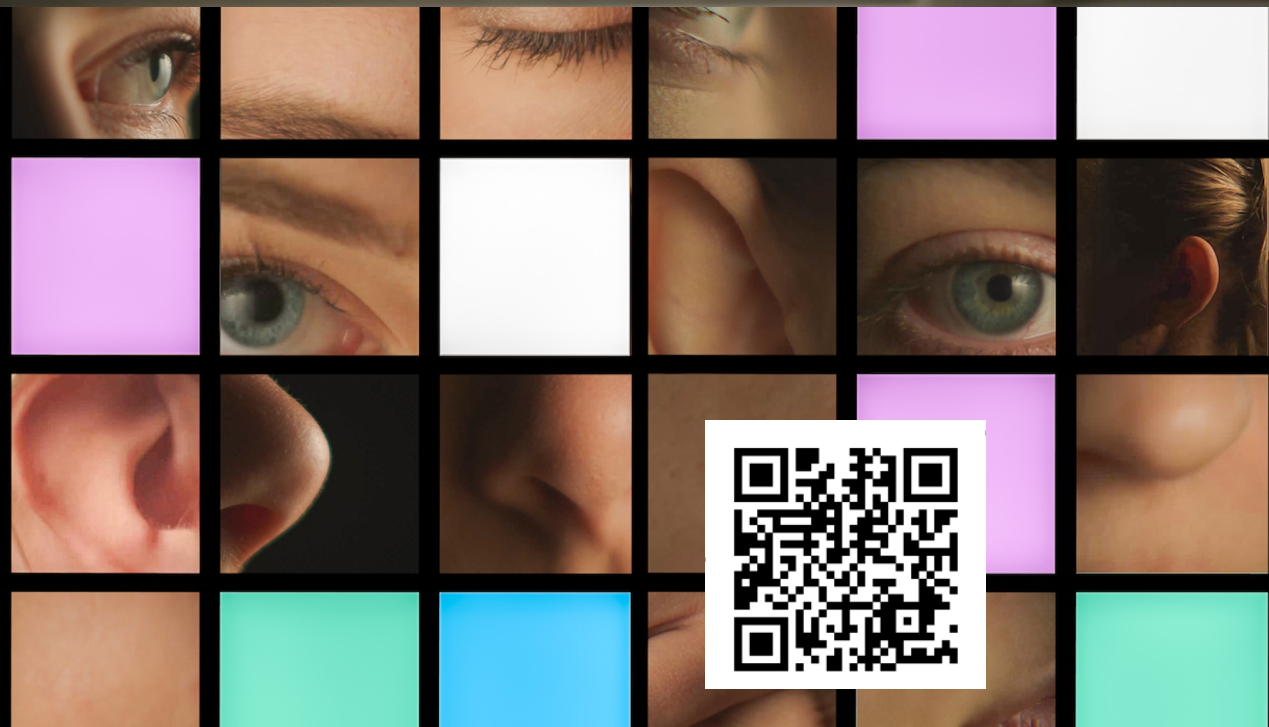
**"Show me your web searches. I'll tell you who you are."
Example: Data experiment 'Made to Measure'**



→ Is it possible to reconstruct a person and their life based solely on their web searches from the past? Can you build a doppelganger of a person you don't even know?



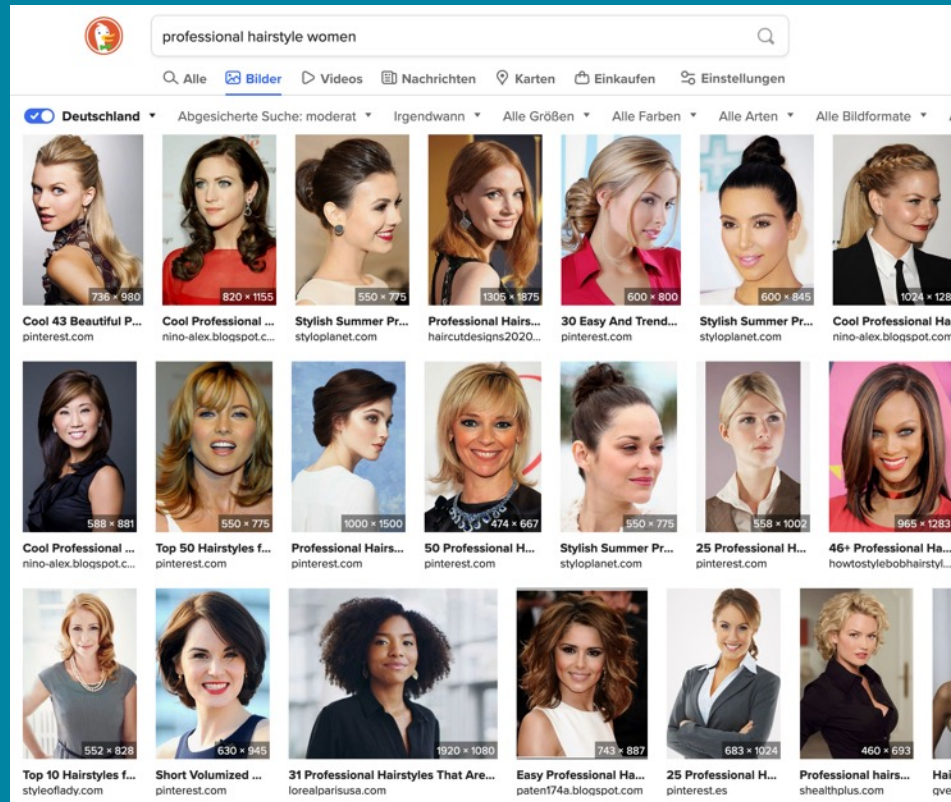
→ Data experiment 'Made to measure'
Interactive film: madetomeasure.online/en



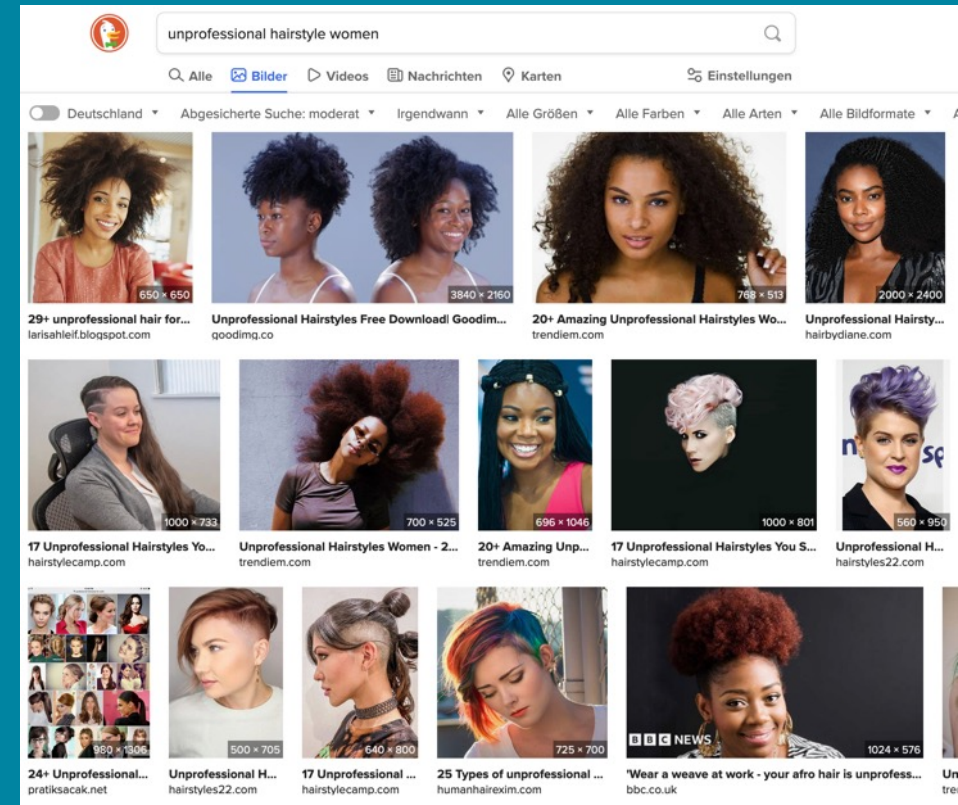
3.

Current websearch is not only a mirror of society.
It also **manifests** stereotypes and power structures
and it even **amplifies** distortions and biases.

Prejudices, distortions and misrepresentations in society are reinforced and amplified | Example: Race

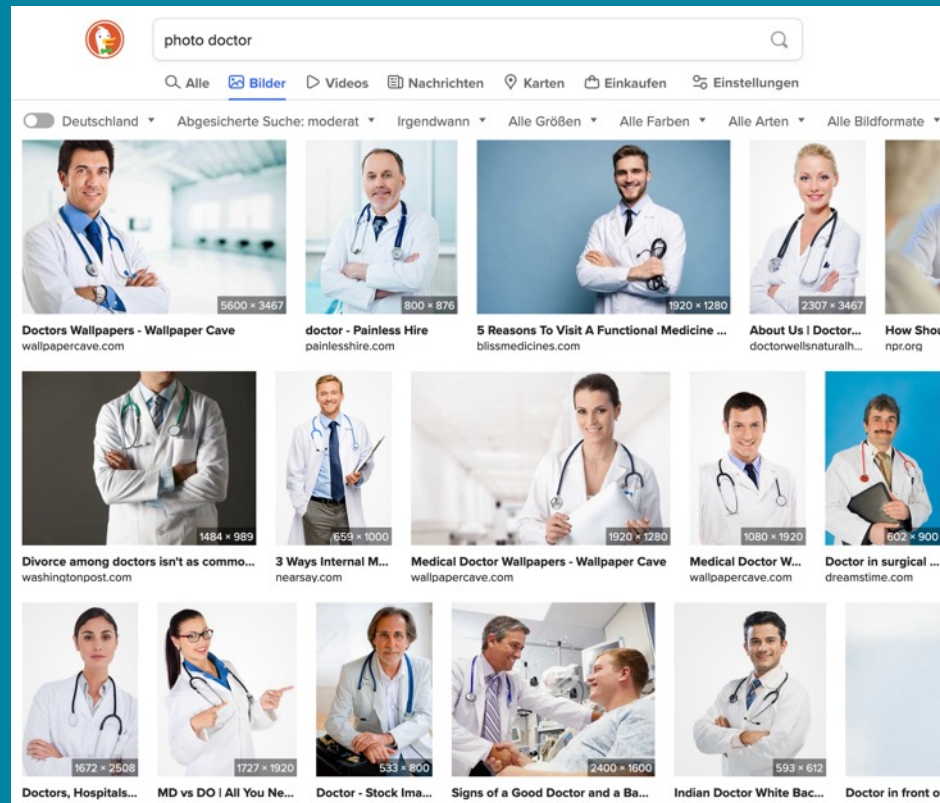


“Professional hairstyle women”

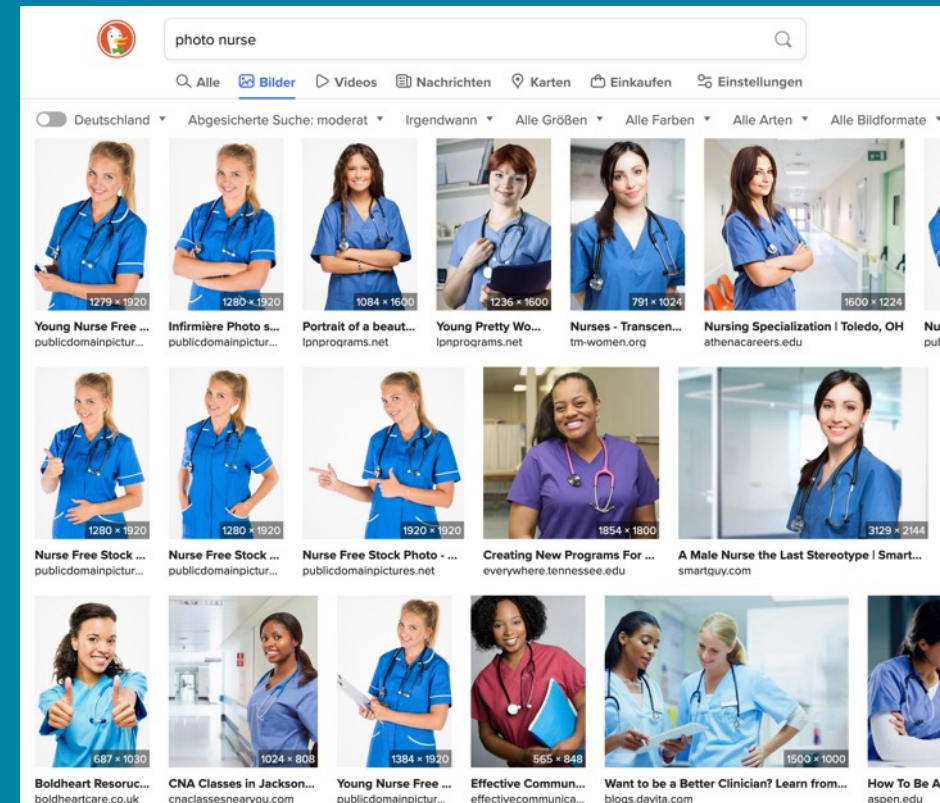


“Unprofessional hairstyle women”

Prejudices, distortions and misrepresentations in society are reinforced and amplified | Example: Gender



“photo doctor”



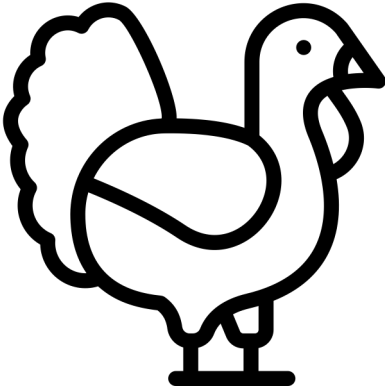
“photo nurse”

4.

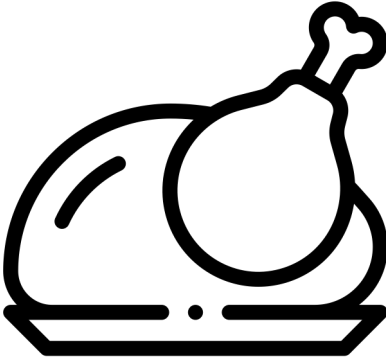
Localised/personalised search results:
different answers/rankings depending on
region, time, device, search history

Advantage: The right answer in the right place at the right time

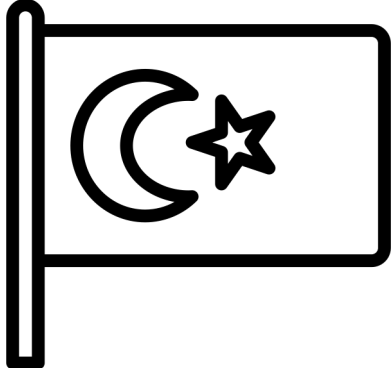
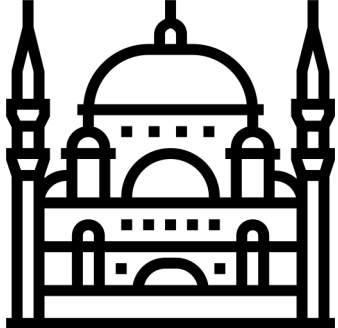
Example: Turkey



Animal



Holiday/food



Country

Like a big library? Well, no ...

Google itself says that its search engine is **"the world's largest library"**.

- But: Google shows different search results for each of us, depending on where we are, what we have searched for before, what devices we are using ...
- „Books“/Information are not "catalogued" as they are in a library. Instead, they are filtered, sorted and prioritised in an ever-changing ranking system.

This has a direct impact on the diversity of content that we users experience.

BUT: Imagine a library,

- that decides which books to show you and which to hide from you
- In which the books constantly change their location depending on which person enters them and
- where the "customers" are not aware of this?



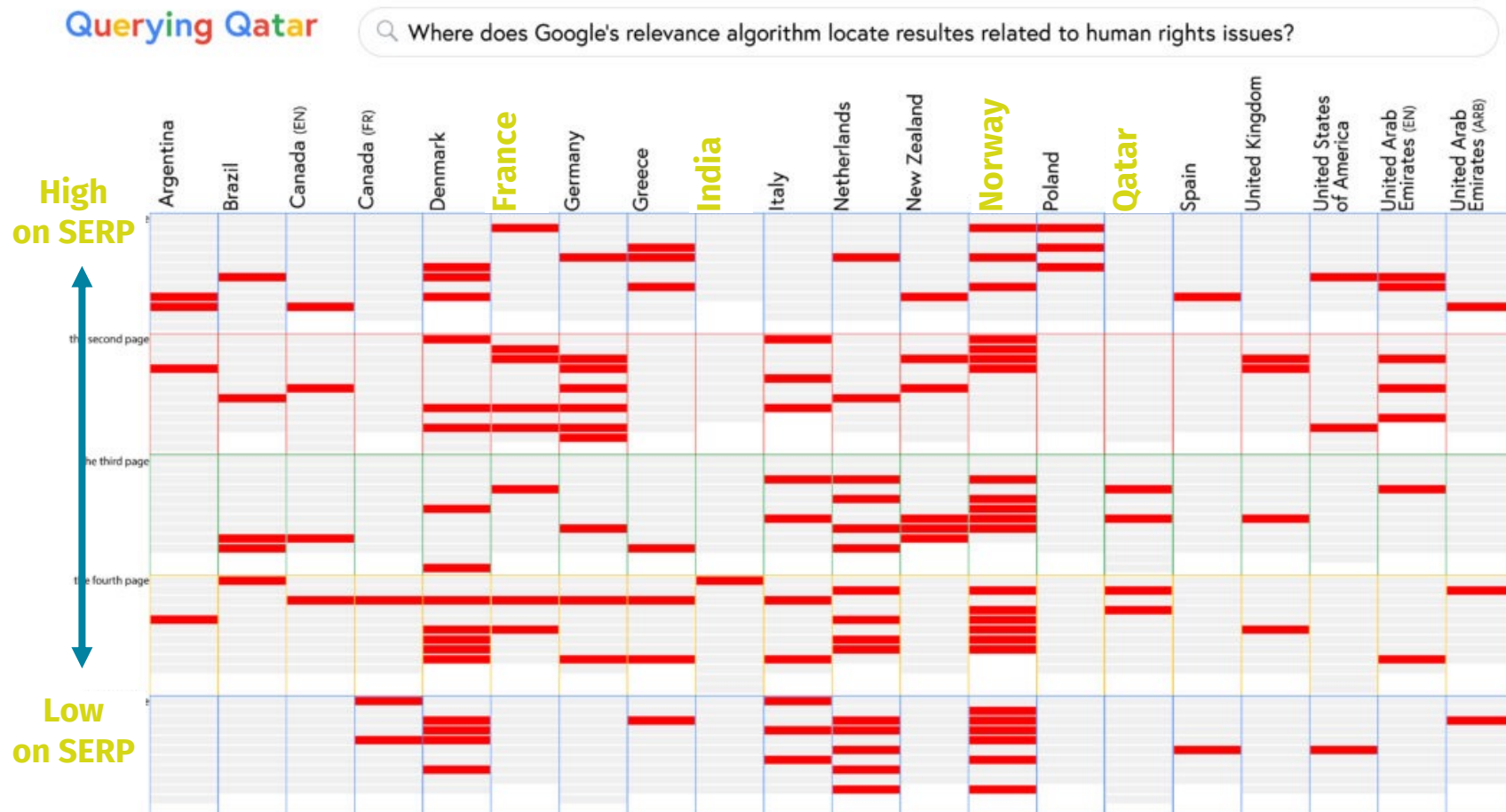
Danger: Lack of a common understanding of the world, risk of disinformation and censorship

Example: 'Qatar World Cup'

Googling 'Qatar World Cup' in different countries

→ Country comparison based on the football World Cup in Qatar: Where do pages discussing *human rights in Qatar* land on the SERPs in different countries when you google "Qatar World Cup" in the native language?

- Verticals are SERPs in different countries
- Red marks are pages that deal with the human rights situation in Qatar



5.

Directing and influencing user behaviour:

Autocomplete

“Let’s face it – we’re all a little lazy”

Example: Autocomplete

Well-intentioned, gone wrong?

Autocomplete was originally developed to make search more comfortable by saving time in query formulation

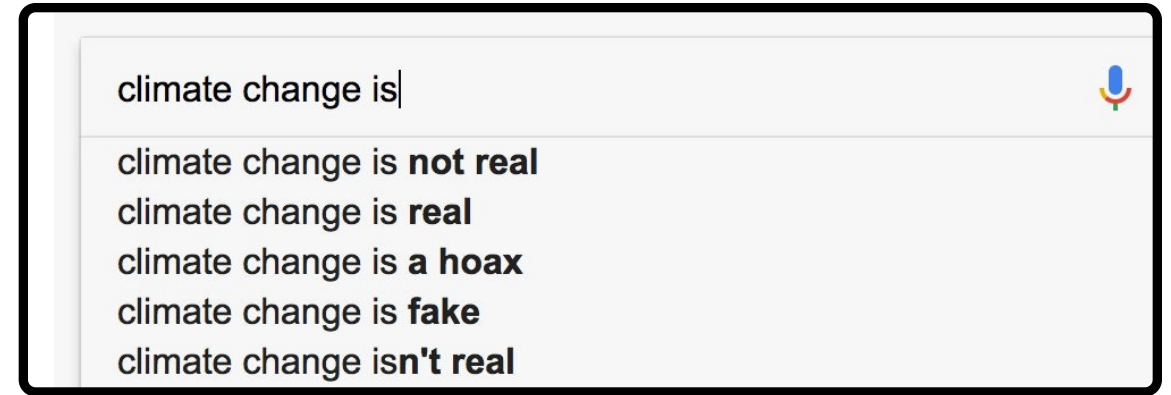
But:

- Creation not transparent
- Reinforces stereotypes (women are ..., jews are ..., ...)
- Reinforces disinformation (climate change ...)

Influences people's search behaviour, possibly distracting from the actual search goal to fakenews/ sensational info; maybe even influencing electoral decisions

Defamation: Can be damaging to the reputation of public figures, when autocomplete associates an individual’s name with criminal, shameful, or unsavory conduct

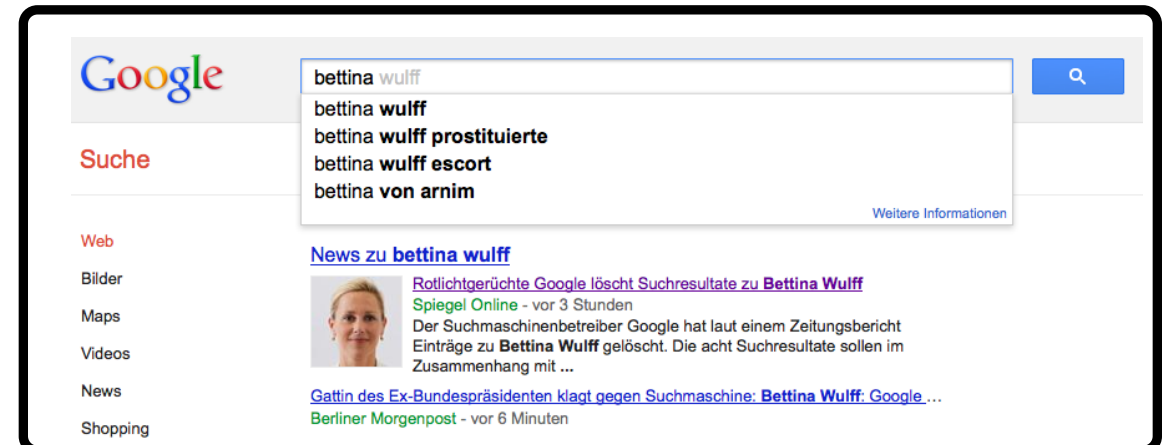
Can be funny ([WIRED Autocomplete Interviews](#))



Credit: <https://www.wired.com/story/google-autocomplete-vile-suggestions/>

Autocomplete Defamation Case Study: Bettina Wulff

A former “First Lady” once sued Google for [autocomplete defamation](#): Bettina Wulff — the now ex-wife of Germany’s former President, Christian Wulff



Credit: <https://netzpolitik.org/2012/google-loscht-einige-suchresultate-von-bettina-wulff/>

Autocomplete is apparently easily hackable

Example: www.autosuggest-web.eu

An agency offers to bring your own key phrases into Autocomplete for a fee

Promotional email from the agency:

„... developed a whole new approach to search engine marketing“

„... The idea is to add a new suggestion to the auto-completion in the search engine, so that your company is suggested directly at the top, e.g. for "pr agentur münchen tourismus" (other keywords are also possible).“

„... a kind of ‚digital recommendation marketing‘ ...“

Die Idee ist, der Autovervollständigung in der Suchmaschine einen neuen Vorschlag hinzuzufügen, sodass Ihr Unternehmen bspw. bei "pr agentur münchen tourismus" (auch andere Keywords sind möglich) direkt ganz oben vorgeschlagen wird. Dies würde dann z.B. so aussehen:



Es handelt sich hierbei um einen komplett neuen Ansatz und unterscheidet sich vom typischen Online-Marketing wie SEO oder bezahlte Ads, die wirklich sehr teuer sind.

6.

Search engine results pages (SERPs)
can put the content of a website into a
different (and possibly wrong) context

Search results can give a false impression

Example: RKI Robert Koch Institut

The German federal government agency and research institute responsible for disease control and prevention, **RKI, apparently admitted on its website that children were knowingly poisoned by Covid 19 vaccinations**

- The „proof“? Just a screenshot from the Google results page
- But: The text from the Google result simply represented objections from vaccination opponents that are scientifically refuted on the website's FAQs. A click on the link would have revealed this quickly.

Search literacy and activity from the users are needed to prevent misunderstandings and disinformation

The image shows a screenshot of a Google search page. The search bar contains the text 'sind impfungen gefährlich'. Below the search bar, the results show 'Ungefähr 847.000 Ergebnisse (0,66 Sekunden)'. A search result from 'www.rki.de' is highlighted, with a snippet that reads: 'Bedeutung von Impfungen - Antworten des Robert Koch ... - RKI 14: Impfstoffe enthalten gefährliche Chemikalien, mit denen die Kinder wissentlich vergiftet werden. In einigen Impfstoffen sind Formaldehyd, Aluminium, Phenol ...'. A callout box above the search bar contains the text 'Search query: "Are vaccinations dangerous"'. Another callout box below the search result snippet contains the text: '“Importance of vaccinations - Answers from Robert Koch ... Vaccines contain **dangerous** chemicals that children are knowingly poisoned with. Some vaccines contain formaldehyde, aluminium, phenol...”'. The entire screenshot is framed with a thick black border.

7.

What is real history, what is created?

The influence of AI

History?

Do you know this place?

- This photo has been the first google search result for Tiananmen Square
- It is not a real photo but an AI-generated „Selfie“
- Search engine users often cannot distinguish between real information/photos and AI-generated content

Source: Emanuel Maiberg, 404 Media, <https://www.404media.co/first-google-search-result-for-tiananmen-square-tank-man-is-ai-generated-selfie/>, 28.09.23



8.

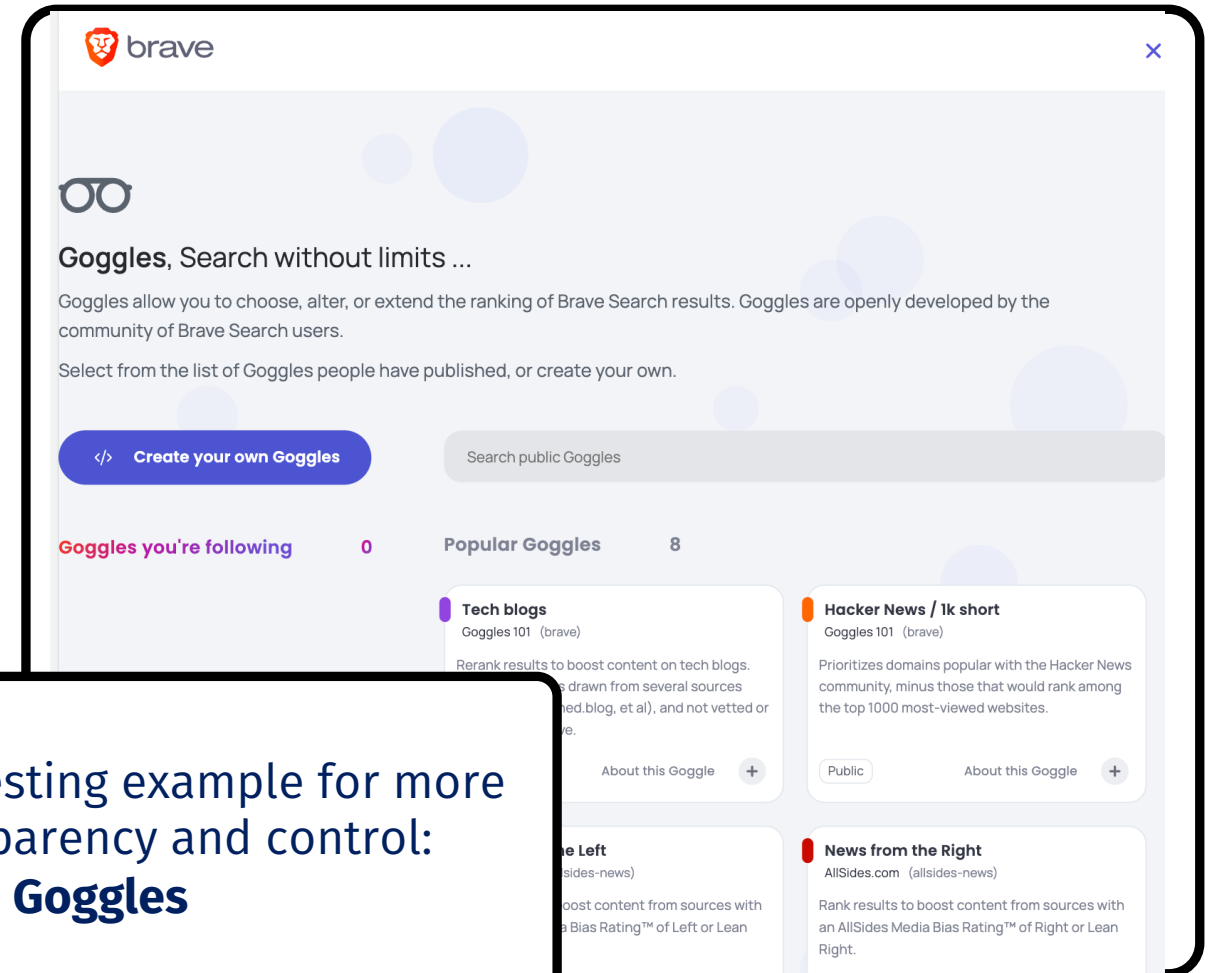
Lack of (algorithmic) **transparency** and
explainability

Transparency/explainability is a need and a right

How come search results about?

In general, there is a lack of explicability, transparency and controllability as to how a search result is generated. E.g.:

- Why is the pharmaceutical site ranked higher than the support group we were looking for?
- Why are my search results different from those of my neighbour?
- Also: Lack of control over the search and filtering process



Interesting example for more transparency and control:
Brave Goggles

The findability of Google pages explaining how their search works and their clarity is low

Example: 'Medienanstalten' research study

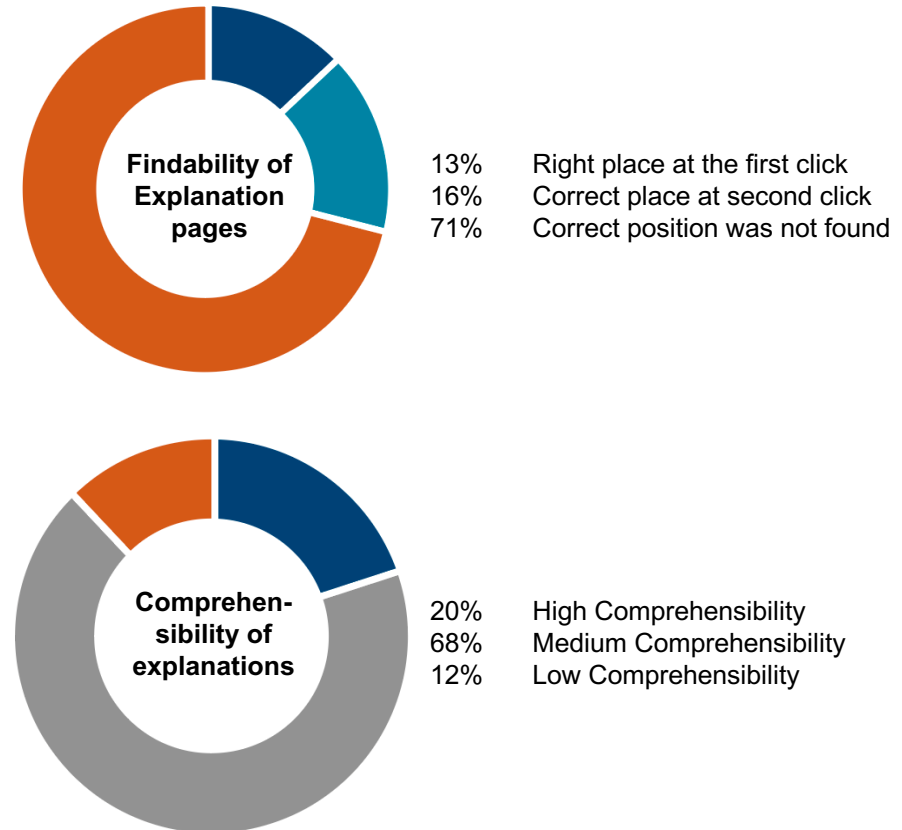
German law* requires transparency disclosures about how search (algorithms) work. Users should be enabled to use the content in an informed manner. Information must be easily perceptible, directly accessible and in 'easy language'.

Study shows: The information provided by Google is very hidden and difficult to understand

On the Google homepage, 71% cannot find the right way to the transparency information even on the second try.

21% would most likely search via Google search, only 13% in the menu. But: one needs to know that this information exists at all in order to be able to find it.

The knowledge quiz on the text read shows that only 20% of respondents consider the transparency information to be as easy to understand as required by law.



<https://www.die-medienanstalten.de/service/pressemittelungen/meldung/mehr-transparenz-zur-funktionsweise-von-google-youtube-instagram-co-erforderlich>

Search engines shape our view of the world.

- Search results at the top of the page seem important and relevant to us. We do not notice results further down.
- Search engines not only provide information online, but also direct and control the flow of information.
- We all get different search results depending on where we are, how we phrase our search, what devices we use and what websites we have visited before.
- Intransparent algorithms determine what we get to see and what we don't.

Ethical issues are **not** about good or bad, right or wrong

- Ethical concerns can arise at or root **in any point** in the search process.
- They are usually **not intentional**. Often there is a conflict between two values, for example convenience vs. privacy, speed vs. influencing users, transparency vs. usability
- Often things have **not been thought through enough** in advance or uses are surprisingly different than expected
- Once identified, **many issues could be solved** through information/transparency, changes of course or sometimes simply by omission/austerity.

So what is the problem again?

- **MONOPOLY / DEPENDENCY:**
We have no real alternatives.
- **LACK OF TRANSPARENCY / ACCOUNTABILITY / EXPLAINABILITY:** How do results come about?
- **LACK OF NEUTRALITY:** There is always a one-sided interest – commercial (Google, Bing) or state (Baidu), both (Yandex).
- **LACK OF COMPARABILITY:** We all get different results displayed, sometimes no common picture of the world.
- **LOSS OF PRIVACY / TRACKING:** Search engines are usually financed by advertising. They live from the fact that they collect our data, merge it, evaluate it, process it and use it for their own purposes or those of their customers.
- **MANIPULABILITY:** Search results, ranking, visibility, decisions of people

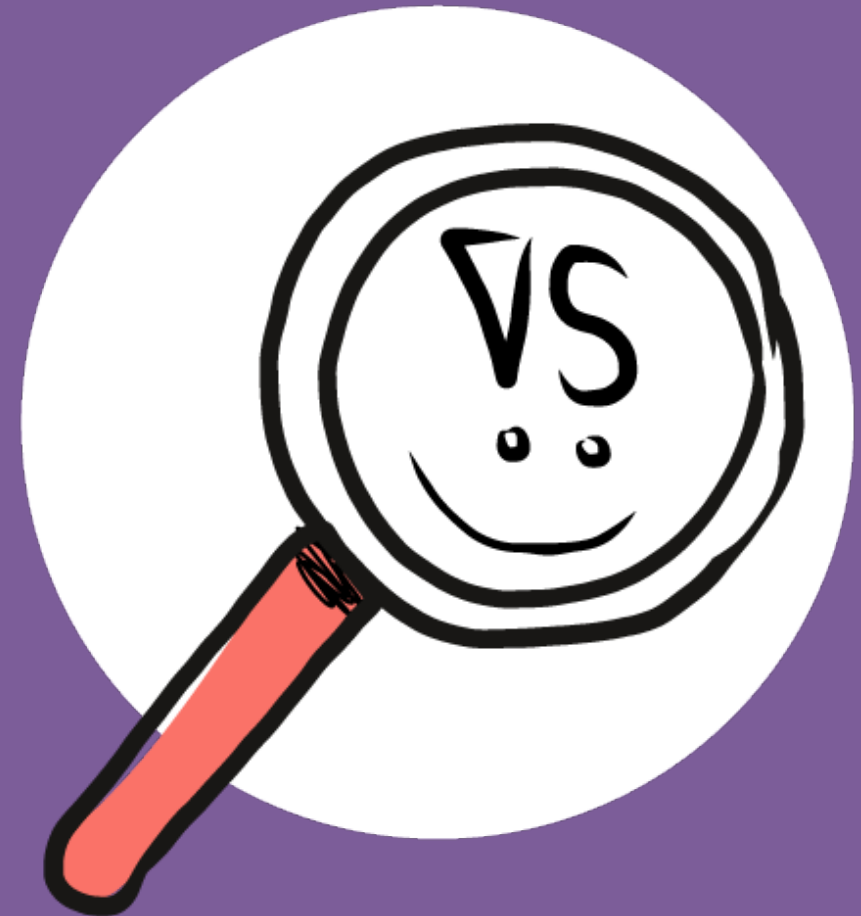
2. What negative Examples can you imagine?

Think of everything negative, unethical
that can happen. Go wild!

Group work – 15-20 min



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3. Impulse „10 Values“

10 min



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1. Openness

General description: Openness is a virtue of people or organisations that stimulates progress and growth, in contrast to closed-mindedness, narrowness, and rigidity. Openness can be practised in at least three directions. First, openness is directed toward people and is receptive to others, inclusive rather than exclusive, and welcomes diversity. It values (not just “tolerates”) others, and seeks to discover the gifts and talents of those others. The second direction is toward ideas (intellectual openness), which includes openness to creativity, innovation, and novelty. Third, openness is directed toward criticism. Besides criticism on technical or business grounds, ethical criticism asks if a technology or a business decision is good or bad for people or organisations.

Relevance in OWS: The openness concept in OWS context addresses receptiveness towards integration of new concepts and technical contributions, but also the usage and exploitation of the data and services provided by the OWI. It addresses a wide range of different types of stakeholders located globally. In addition, openness also includes the acceptance of ethical criticism of the developed software, concepts, and services. Hence, openness is also relevant to i) establishing OWI as critical infrastructure and, ii) building an ecosystem around it.

2. Transparency

General description. As an ethic that spans science, engineering, business, and the humanities, transparency is operating in such a way that it is easy for others to see what actions are performed. Transparency implies openness, communication, and accountability. Transparency also includes the concepts of explainability, observability, understandability, and controllability.

Relevance in OWS. Transparency in OWS context relates to the data and algorithms available in the OWI and related applications. Metadata, data analysis, algorithmic decisions, and the overall approach should be made transparent to the user in a way that the user can easily understand the matter, without creating a cognitive overload (e.g. caused by excessive technical data). Furthermore, users should have access to the data and algorithmic operations making them as accessible and understandable as possible for the user.

3. Trustworthiness

General description. Trustworthiness relates directly to ethics on two specific dimensions such as integrity and benevolence. A trustworthy party is one that will not unfairly exploit the vulnerabilities of the other party in the relationship. Trustworthiness correlates with trust, as a person can trust someone or something that is trustworthy.

Relevance in OWS. Trustworthiness addresses the processes of OWS that ensure integrity of the data and services. This includes a careful and reflective design of the processes and algorithms, as well as the responsiveness in case of problems. In particular, it needs to focus on the data and algorithms not only from a functional point of view, but also from the stakeholders perspective that make use of the system.

4. Privacy

General description. Privacy refers to the right of individuals to retain certain personal information without disclosure and to have protection against unauthorised access of any information about themselves that is collected with their consent.

Relevance in OWS. In the context of OWS this refers to i) the personal data that is collected by indexing and through end-user interactions, and ii) the responsible treatment of this data. Search engines need to respect the informational self-determination and privacy of every individual. Furthermore, individuals have a right to make informed choices about data collection, advertising, and personalisation tools. This also means that there must be easy ways to obtain consent and to remove content.

5. Responsibility and Accountability

General description. Responsibility refers to both the obligation and liability for which someone is held accountable. The obligation refers to someone or something that has to deal with certain issues because of a duty. The liability refers to the accountability of someone or something that has to give reason or handle consequences of actions.

Relevance in OWS. Responsibility is an important value when it comes to problems with data and users, which require a careful reaction to detected and reported problems and errors.

6. Simplicity and Usability

General description. Simplicity relates to usability and means the usage of a system in an easy and understandable way, minimising unnecessarily high levels of complexity. Usability refers to the capacity of a system to provide a condition for users to perform tasks with safety, effectiveness, efficiency, and satisfaction.

Relevance in OWS. Technical components accessed directly by users should be created in a way that they enable easy and understandable interaction minimising complexity and cognitive load. Dark patterns and functions with hidden purposes should be avoided.

7. Diversity (Cross-cultural sensitivity)

General description. Diversity stands for various differences as well as similarities between individuals. It is often mentioned in context of gender, ethnicity, age, religion, or disabilities, but in general diversity applies to the entire spectrum of differences. Diverse groups or minorities should be provided with equal opportunities, treated with fairness and respect, and not discriminated.

Relevance in OWS. Indexing and search processes should not only respect diverse users, but also actively consider the information collected and provided. For example, search results should contain unbiased information and indexed information should be tagged if problematic.

8. Sustainability

General description. Sustainability is a social goal for people to co-exist on Earth over a long time. Specific definitions of this term are disputed and have varied with literature, context, and time. Experts often describe sustainability as having three dimensions: environmental, economic, and social, where specific focus is on the environmental dimension.

Relevance in OWS. In OWS context all three dimensions of sustainability are relevant. The ecological sustainability refers to energy efficiency of the applied software and the hosting at data centres. The economical sustainability refers to the economical applications that rely on the OWI. Whereas social sustainability refers to the provision of a critical search infrastructure that has value for the society.

9. Reliability

General description. Reliability refers to the consistency, dependability, and trustworthiness of a system, process, or measurement to perform its intended function or produce consistent results over time. It is a desirable characteristic in various domains, including engineering, manufacturing, software development, and data analysis.

Relevance in OWS. In the context of OWS this means that the technology and its processes should be created in a reliable way, so that index uptakers can build on the technology and data. Data and information provided should be of high accuracy and quality in order to provide relevant search results to a broad range of active users such as uptakers and developers. This is very important for both establishing OWS as critical infrastructure, and build up an ecosystem of applications and data products. Reliability is linked to accuracy and trust.

10. Safety and Security

General description. Security refers to protection from, or resilience against potential harm, hostile forces or unwanted coercion. At the core of information security is information assurance, the act of maintaining the confidentiality, integrity, and availability of information, ensuring that information is not compromised in any way when critical issues arise.

Relevance in OWS. The information retrieval , processing and storage procedure procedures of OWS need to adhere to the basic principles of safety, data integrity, confidentiality and availability. This also involves measures for security ensuring the search infrastructure are resilient against manipulation and misuse.

4. Bringing together negative consequences with values

Group Work – 10 min

Presentation – 5 min



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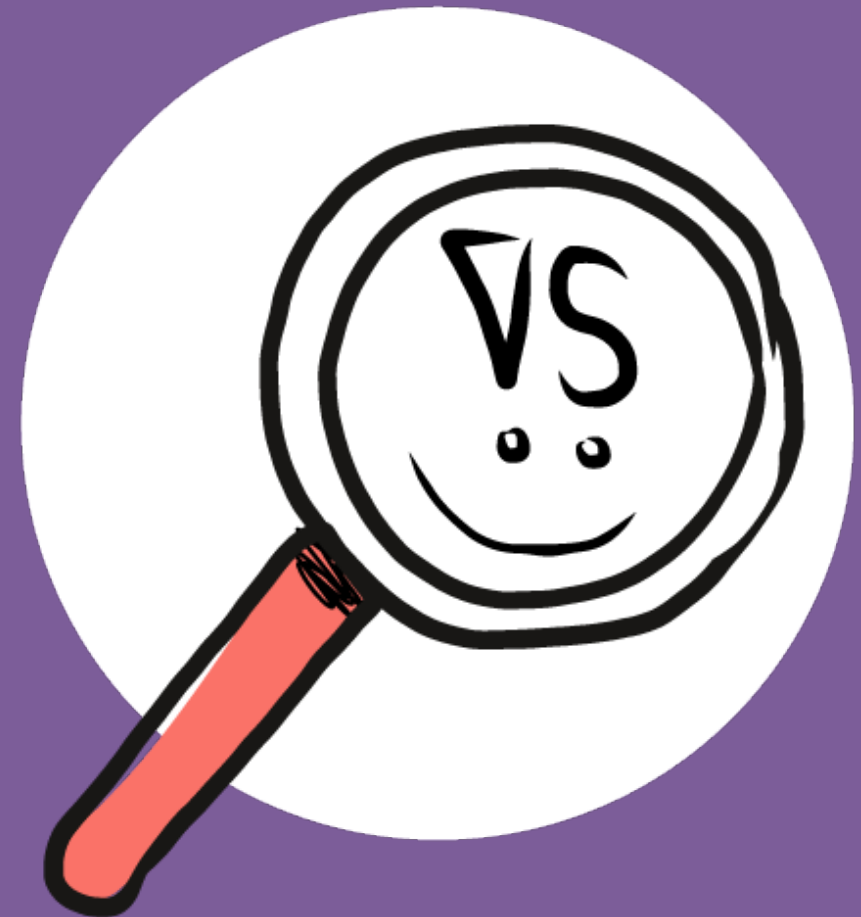
5. Dream big! How could web search be in the future?

Group Work – 10 min

Presentation – 5 min



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6.

Wrap-up and Take aways

5 min



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