AI IN EVERYDAY LIFE

Unit 6 – Personalization

UNIVERSITÀ DEGLI STUDI DI TRENTO
Dipartimento di Ingegneria e Scienza dell'Informazione

DataScientia
Unitas per Varietatem

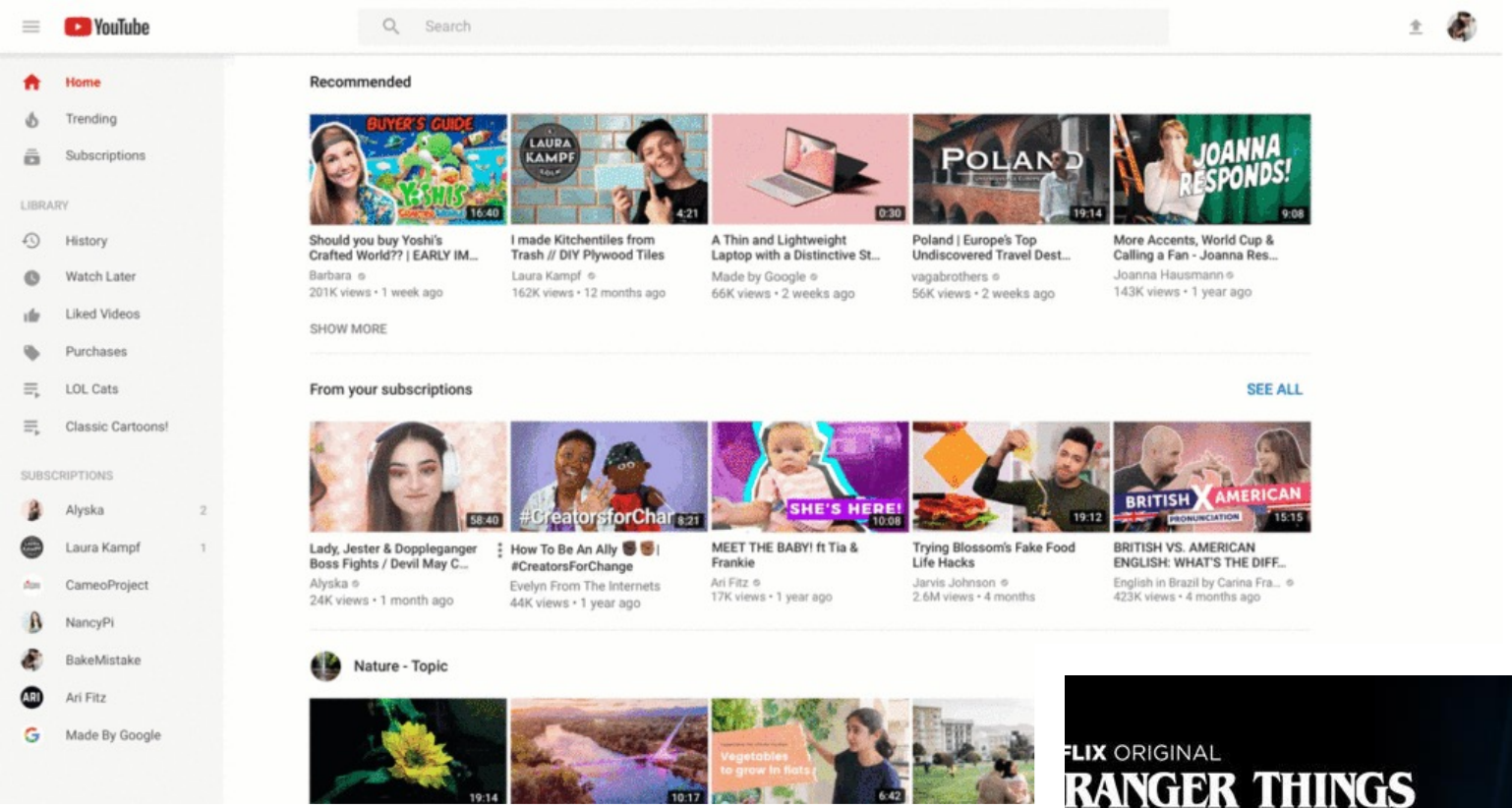
OPEN UNIVERSITY OF CYPRUS

CY. center for algorithmic transparency

OUTLINE

- What is personalization?
- How does it work?
  - Examples from search engine and social media personalization
- Issues and drawbacks of personalization

WHAT IS PERSONALIZATION?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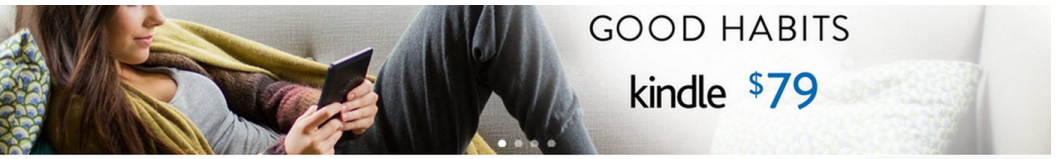
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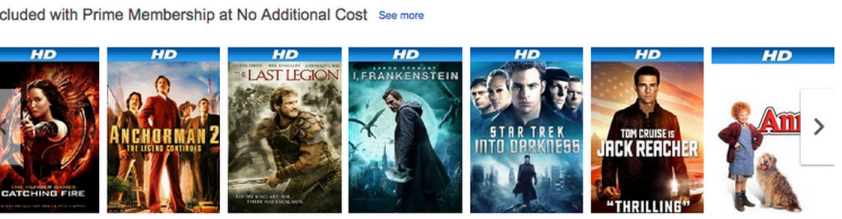
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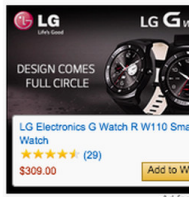
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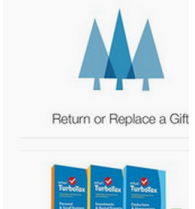
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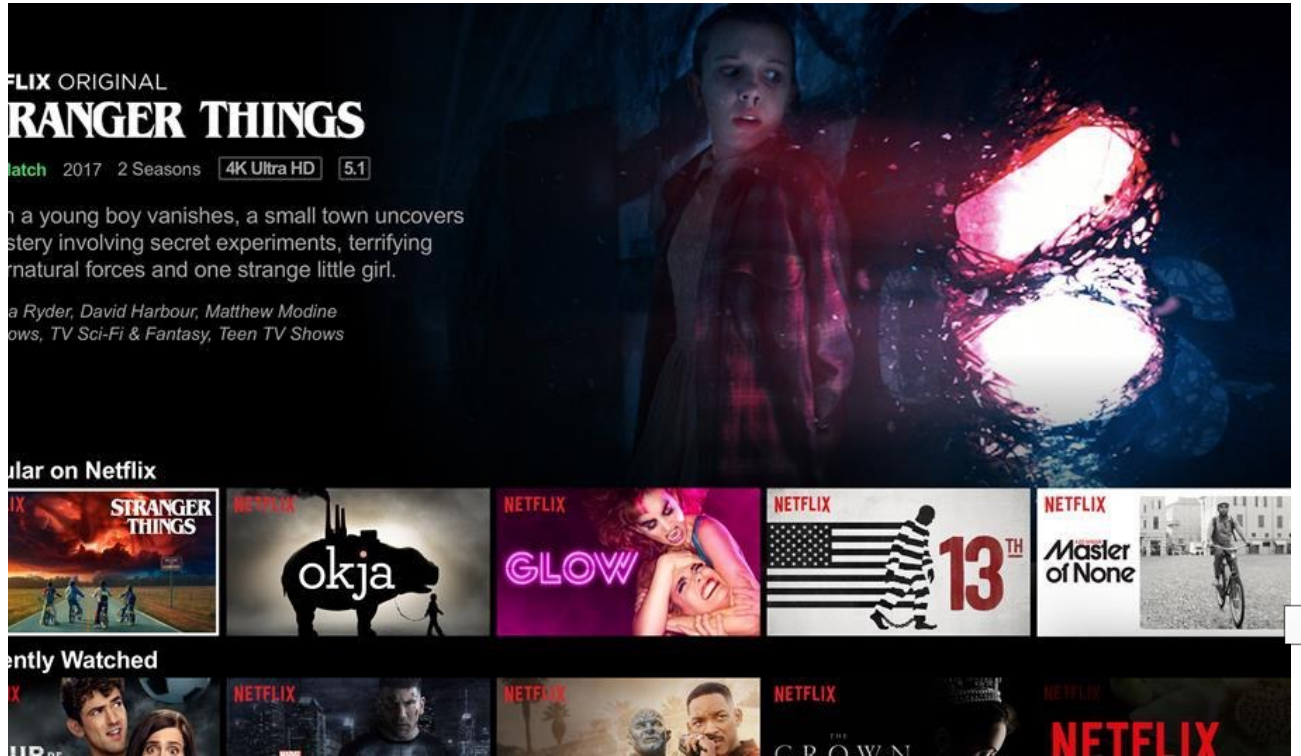
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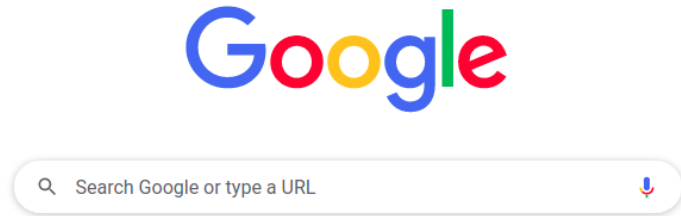
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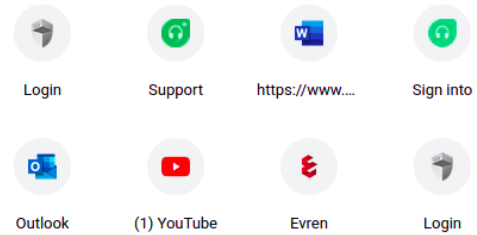
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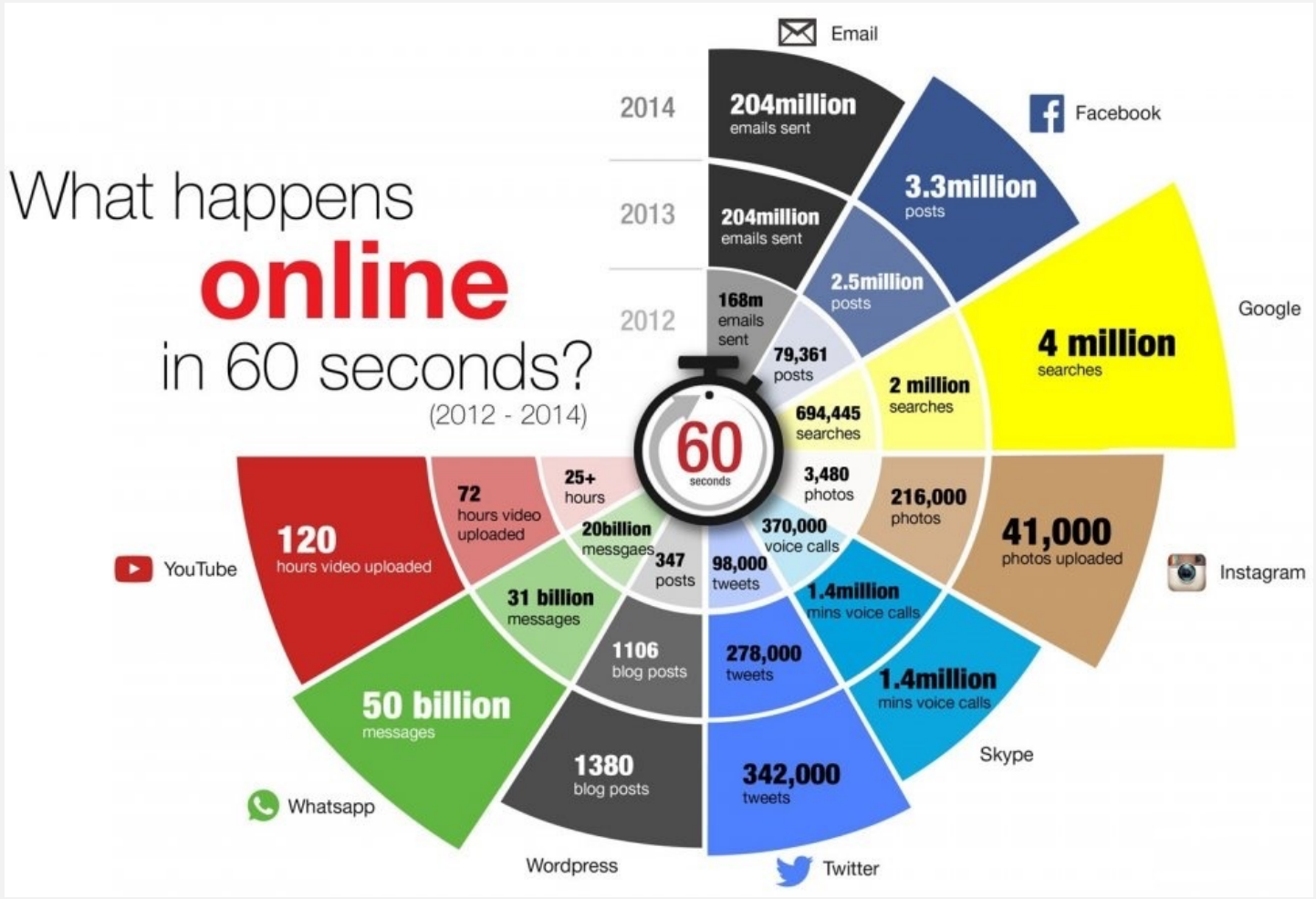
PERSONALIZATION

- “Whenever something changes its functionality or behavior based on information it has about a user, this is called personalization.” (Searby, 2003)



WHY PERSONALIZATION?

Source: https://www.anishsneh.com/2014/07/big-data-volume-velocity-and-variety.html

WHY PERSONALIZATION?

We are different as humans and have access to a wide range of information.

INFORMATION

- Abundance
- Heterogeneity
- Noise
- Limitations (bandwidth, time)
- Location

PEOPLE

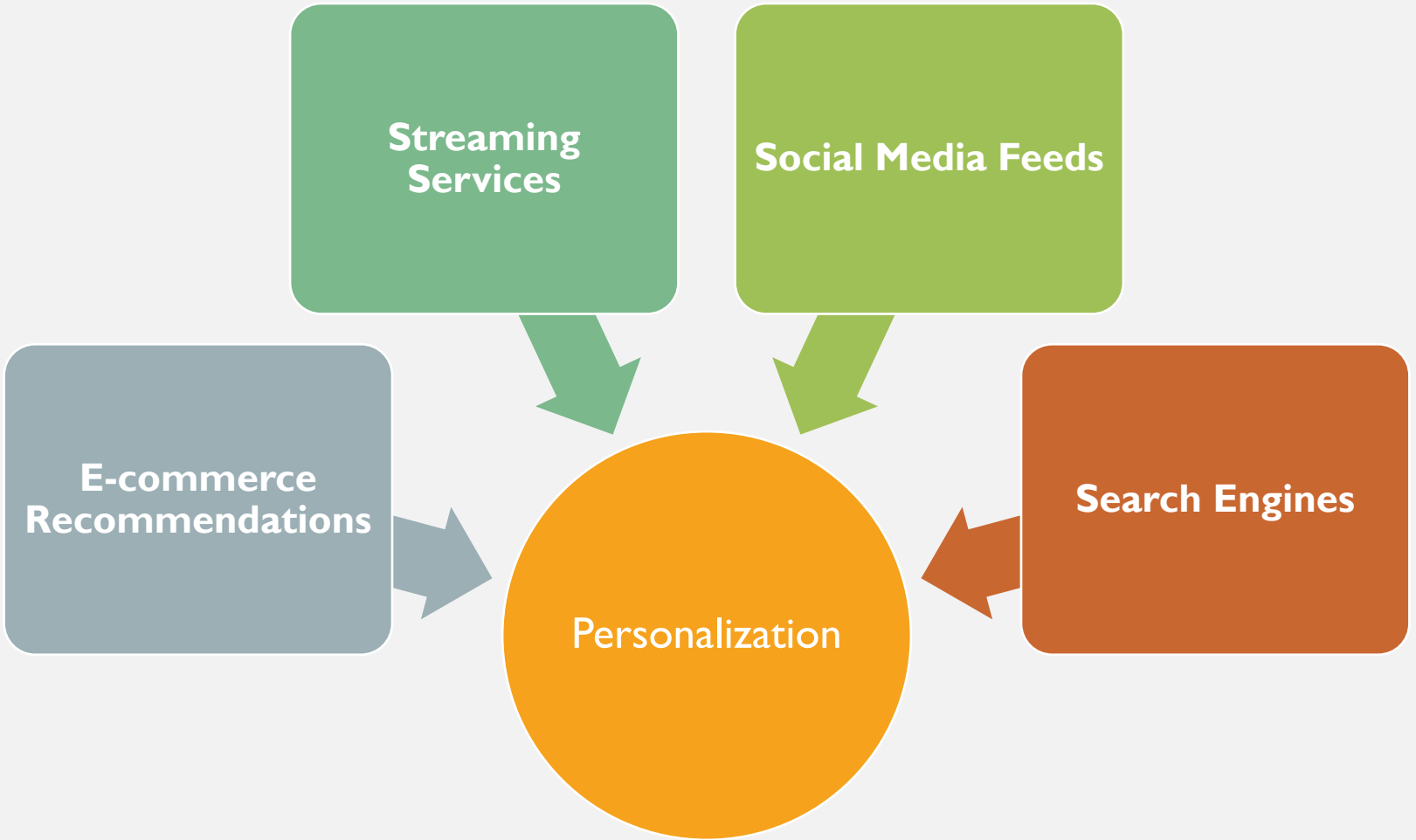
- Capabilities and experience
- Work, goals, intentions
- Frame
- Emotional state

Source: https://ierg3320site.wordpress.com/2017/01/23/what-is-human-information-interaction-and-why-is-it-important-to-me-as-an-engineeringcs-student/

ONE SIZE DOES NOT FIT ALL!

- providing the correct information
- to the right person
- at the right moment
- in the right way

EXAMPLES OF PERSONALIZATION



HOW DOES IT WORK?

THE ARCHITECTURE OF AN ADAPTIVE SYSTEM

User information

Feature extraction

User model

User model application

System customization

TYPES OF PERSONALIZATION

Adaptable systems

- The User can modify aspects of the System according to his own preferences

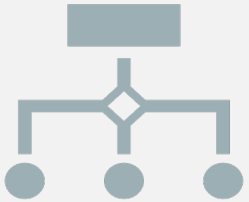
Adaptive systems

- The System modifies its behavior at least partially, regardless of the specifications given by the User

Hybrid systems

- The System suggests possible adjustments, the User decides which of them to accept

METHODS FOR COLLECTING USER INFORMATION



Direct collection of information

Information entered by the user

Reliable

It requires time and willingness from the user to contribute

Indirect collection of information

The system collects the information automatically

It does not tire the user

It must be clear what information is collected and for what purpose.

PROFILE / USER MODEL

Demographic information

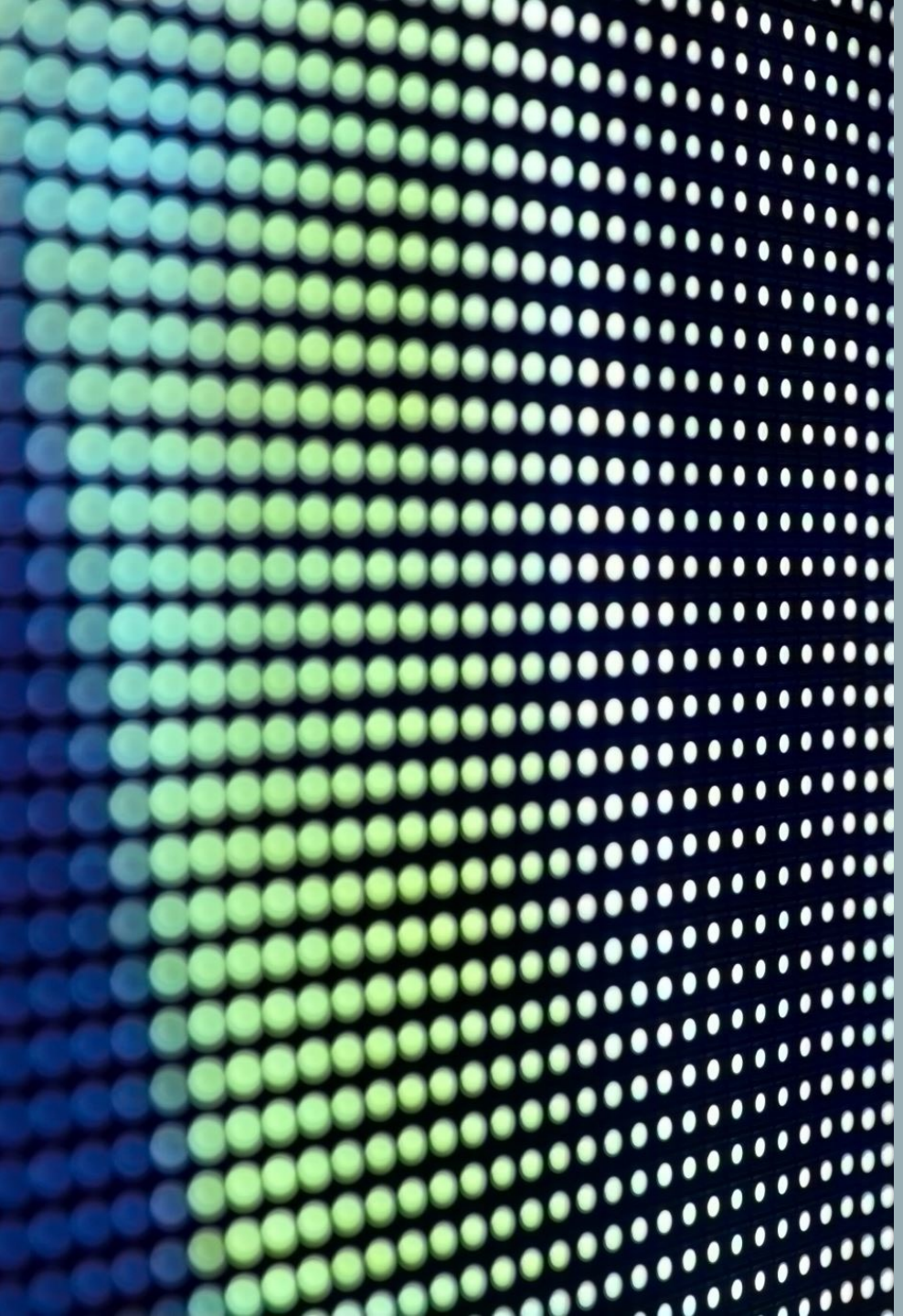
- Gender, Age, Nationality

User's interests

- Keyword list, Topics

User's preferences

- Interaction style, Favorite media



ADAPTABLE AND ADAPTIVE SYSTEM:
THE GOOGLE SEARCH ENGINE

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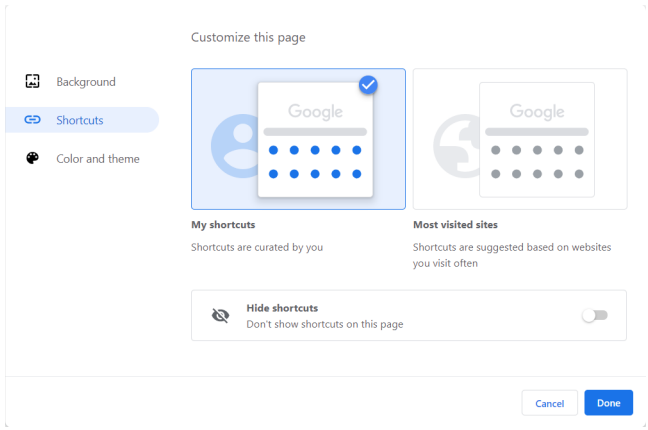

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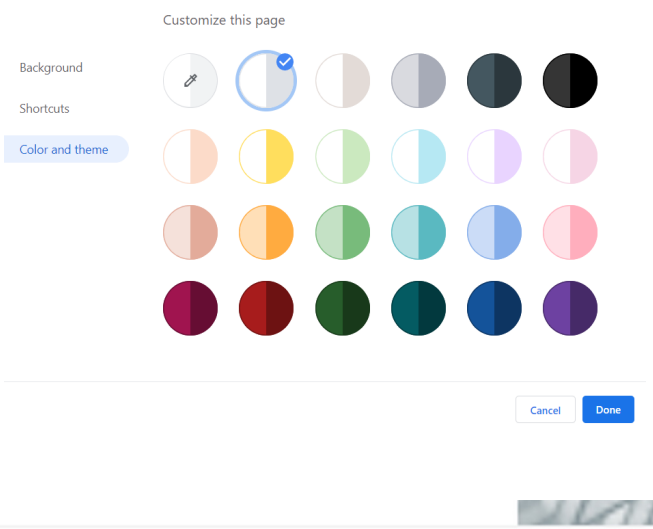

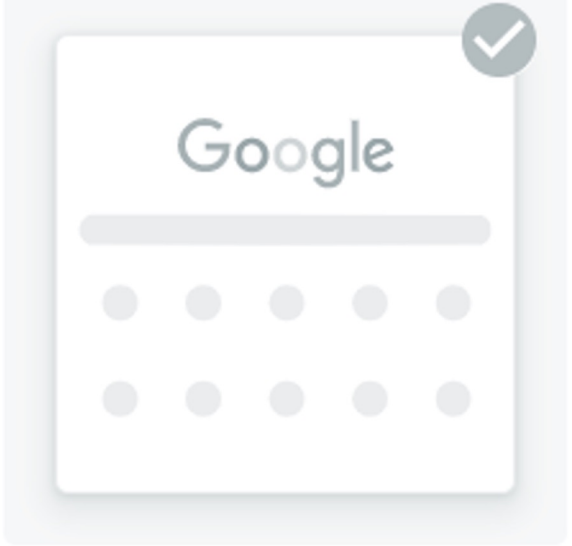

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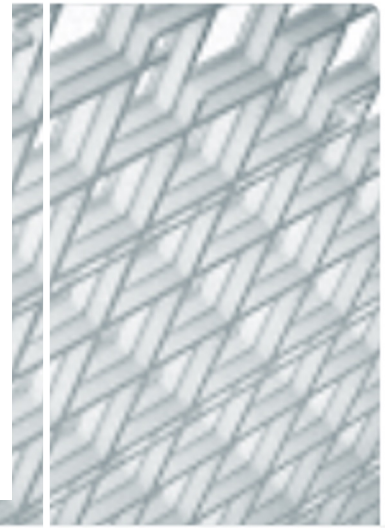

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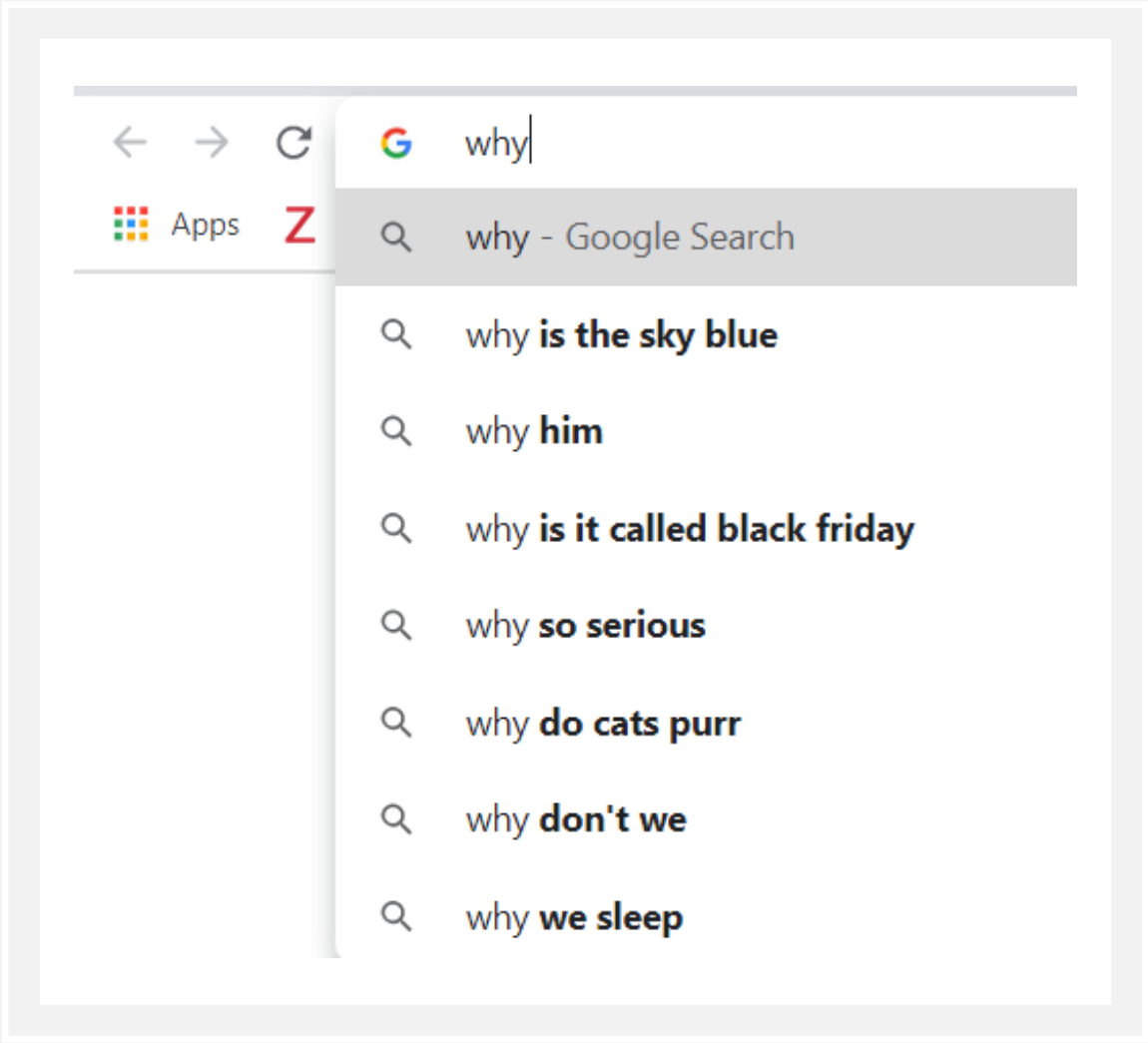
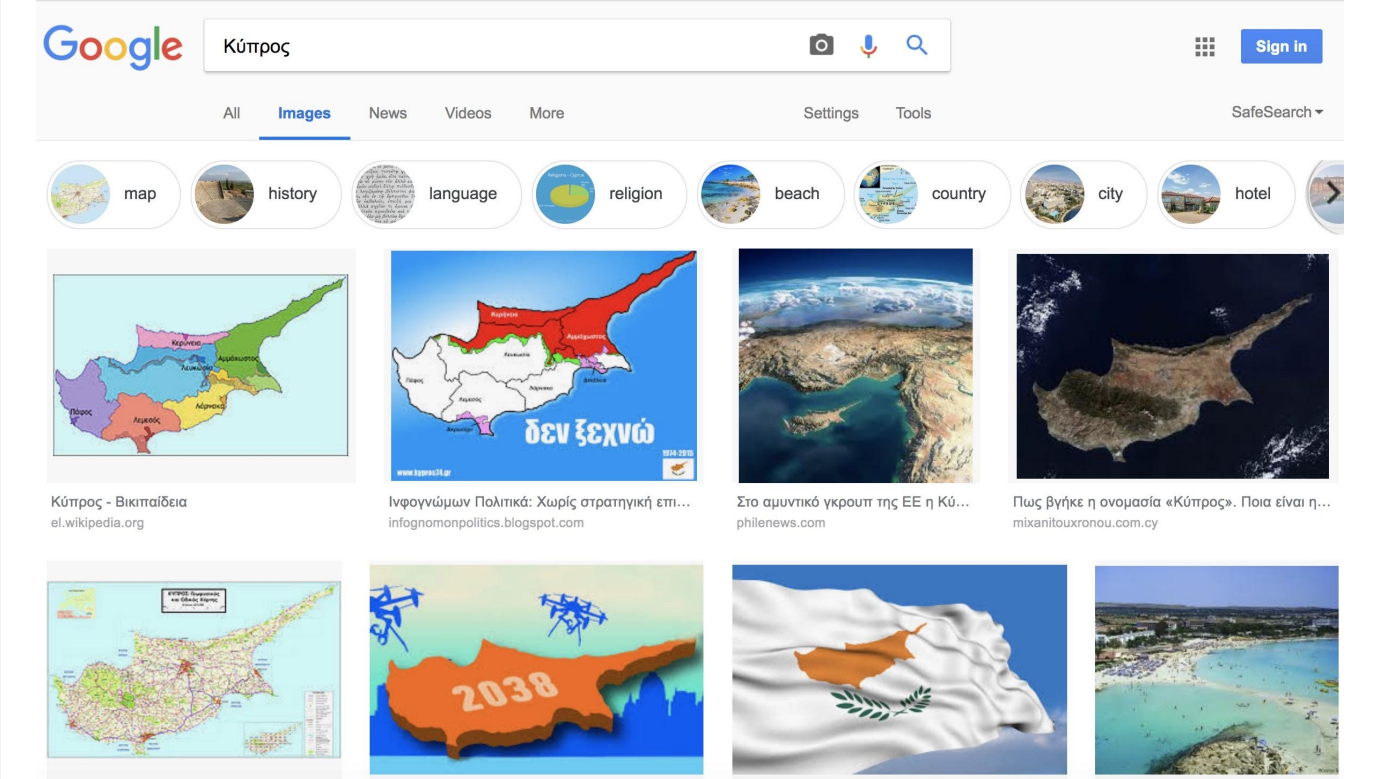


GOOGLE SEARCH

In the Google search engine, the system tries to predict what you are looking for by collecting information about your context (e.g., country) and your previous searches.



GOOGLE SEARCH

Searching for Cyprus in different languages on Google Images can lead to different results

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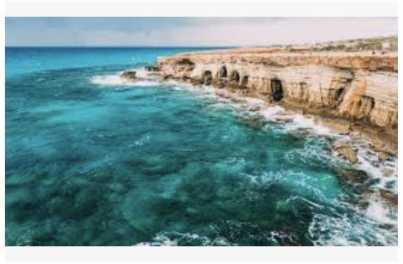

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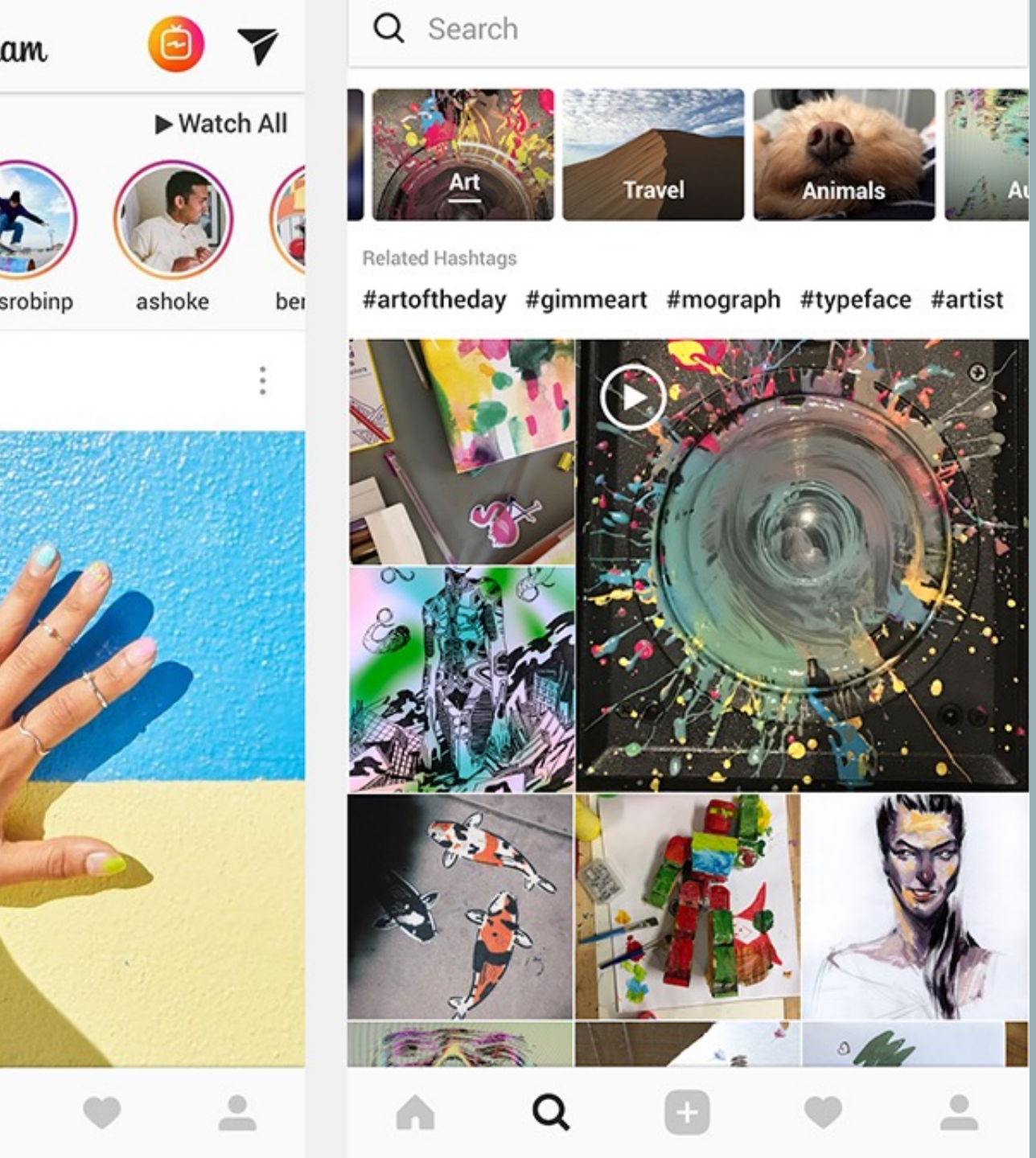
HYBRID SYSTEMS:
SOCIAL MEDIA



POST RECOMMENDATIONS

HOW PERSONALISATION WORKS IN SOCIAL MEDIA?

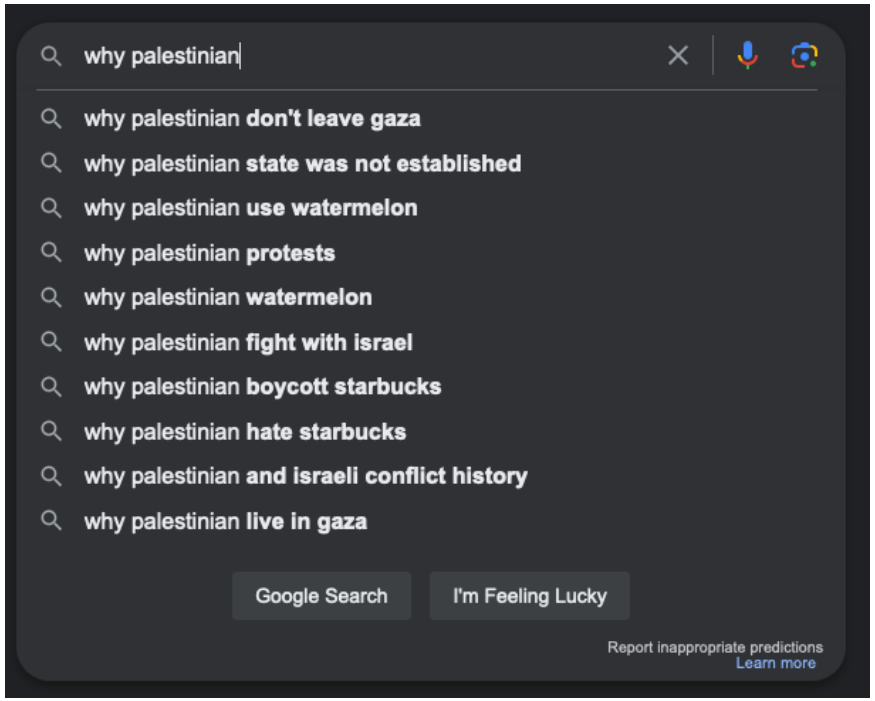
The social network application collects information from the activity of users and their interaction with other people and with the content of the application.

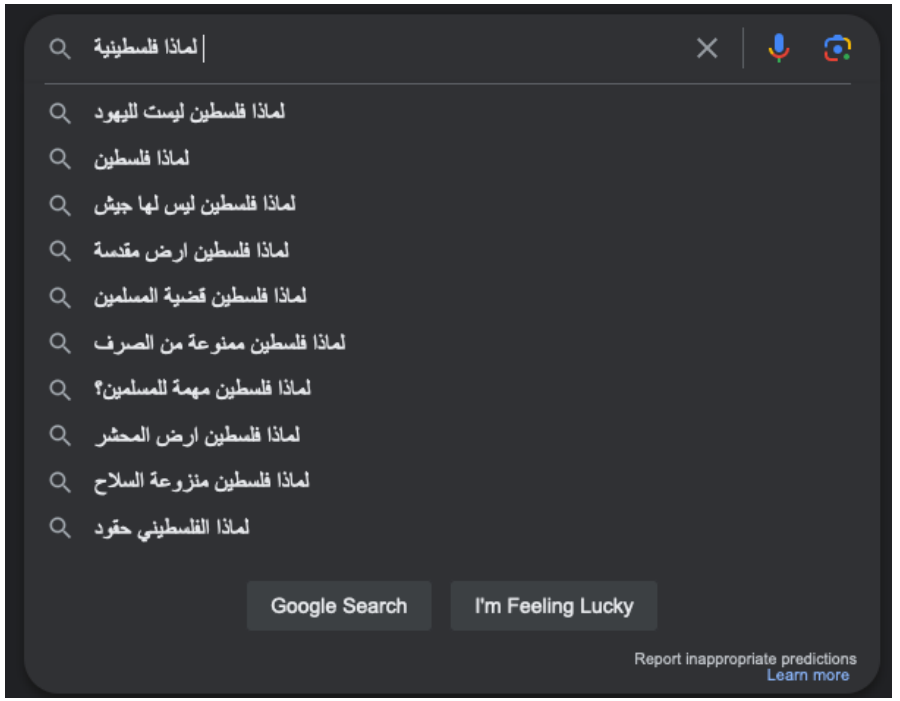
It creates a model for each user and using algorithmic processes, mostly hidden from the user, which make some decisions on their behalf. For example:

- What content will be displayed?
- What time of day/week will this content appear?
- Who posted this content and if it is closely related to this particular user always based on what the system thinks?
- What content will this user be most interested in?
- Which ads will interest this person the most?

DISADVANTAGES OF PERSONALIZATION

1. **Bias and Stereotyping:** amplification of certain perspectives and the marginalization of others
2. **Privacy Concerns:** level of personal information that is used to tailor their experience, lack of transparency and dual use
3. **Manipulation and Addiction:** maximize user engagement amd potentially leads to addictive behaviors
4. **Lack of Serendipity:** hard to discover new and unexpected content
5. **Filter Bubbles:** users are exposed only to information that aligns with their existing beliefs and preferences, limiting exposure to diverse perspectives.



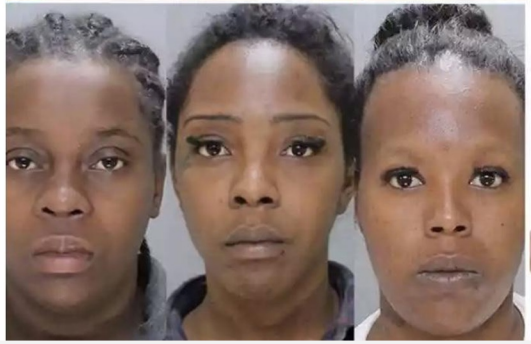


AUTOCOMPLETE AND SOCIAL STEREOTYPES

Google

'Three black teenagers': anger as Google image search shows police mugshots

Stark contrast in outcome for search term 'three white teenagers', which produces wholesome group pictures



https://www.theguardian.com/technology/2016/jun/09/three-black-teenagers-anger-as-google-image-search-shows-police-mugshots

Google under fire over 'racist' image search results for 'unprofessional hair'

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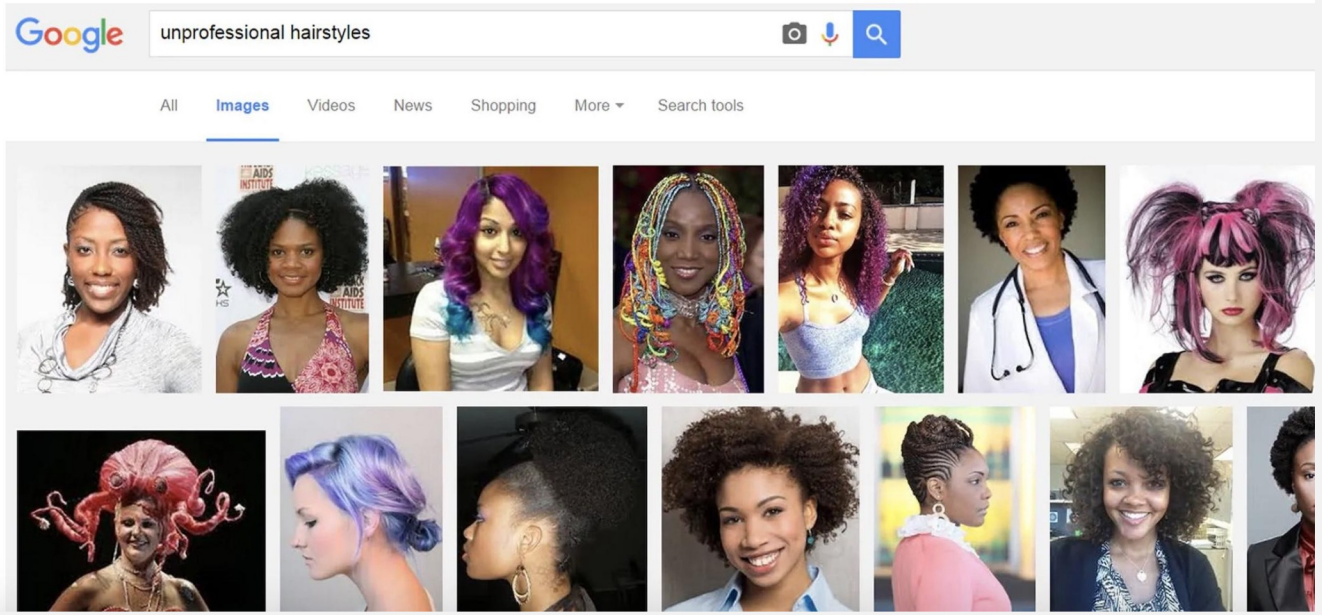
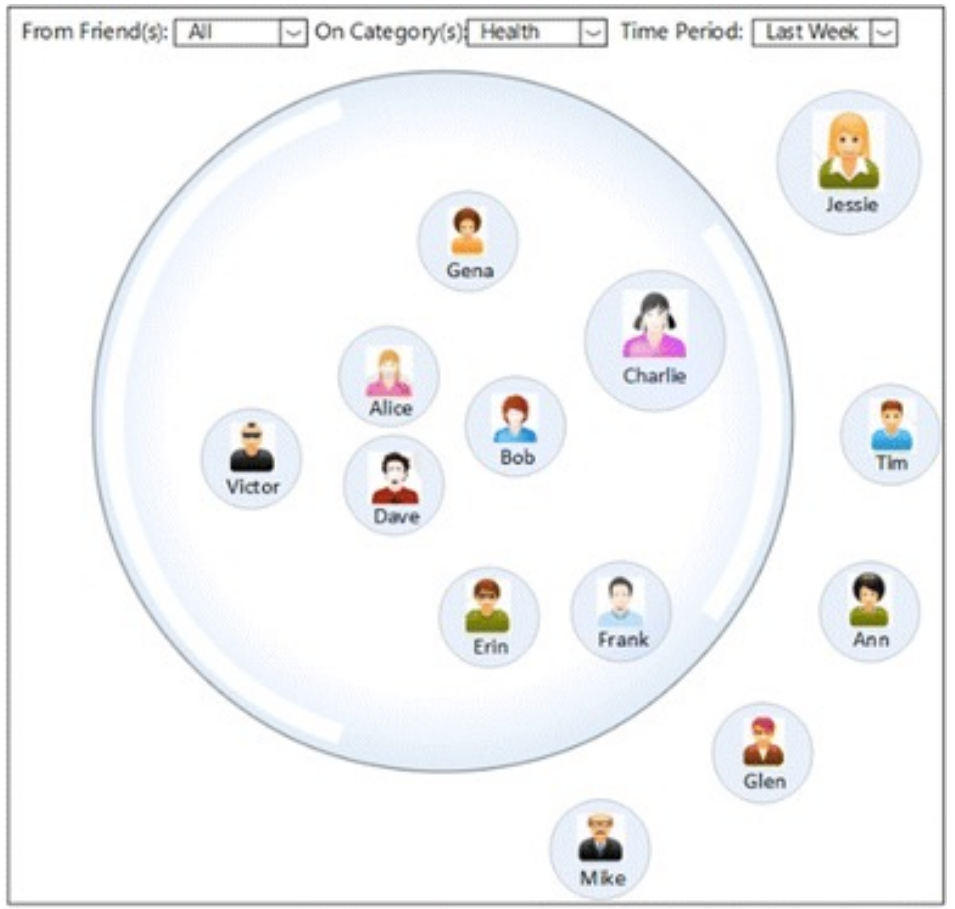


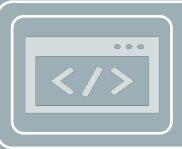
https://www.telegraph.co.uk/technology/2016/04/08/google-under-fire-over-racist-image-search-results-for-unprofess/

FILTER BUBBLE

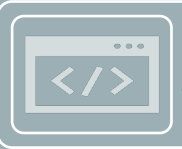


Source: Bozdag, E., van den Hoven, J. Breaking the filter bubble: democracy and design. *Ethics Inf Technol* **I** 249–265 (2015)

LINKS AND CONTACTS



https://datascientiafoundation.github.io/datascientia-education-eai-2023-24-unitn



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