



Heuristics, the social networks, and algorithms

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The world around us generates a huge amount of information, and our senses were created to be able to absorb a good part of such information. Our brain is responsible for filtering out the information collected from the environment and using it to guide our body behavior. Processing the whole information received by our senses would be inviable; we would be stunned with the amount of data received every moment, and the delays caused by such slow processing would make us inefficient.

Inefficient organisms are excluded through natural selection; therefore, only human beings with brains efficient enough to deal with the problems faced by our ancestors were selected.

One of the adaptations carried out by our brains to enhance its efficiency was the heuristics – implemented by mental algorithms that produce the capacity to judge fast and with limited information. These decision-making mental shortcuts permit us to be able to make decisions and not to be distracted by trying to absorb all the information available around us. These algorithms are at work most of the time, if we consider the environment in which they have been developed. When heuristics fail, we call it cognitive biases.

These algorithms underwent improvements during the evolution of the human mind, and were adapted into the environment where evolution took place and for the communities existing at that time. Since then, we have developed the ability to write; we are no longer hunters-gatherers; we have organized ourselves in societies, we have developed the Internet and the social networks. All these changes have happened in the last 40 thousand years – a small time interval for evolution. Each change has enhanced the amount of information that must be interpreted by the brain in one day.

These naturally developed heuristics, however, are no longer the only way to filter out the information we receive every day. Algorithms used by the Internet-operating companies help with filtering out “irrelevant” data. The social network Facebook, for example, used an algorithm called *Edge Rank* to organize the feed of each profile

when a person logged in. This algorithm was based on three values:

- **Affinity** – It refers to how much a piece of news bears something similar to another one that the user is used to interacting with by the options *comment* and/or *like*.
- **Content weight** – If users interacted with a piece of news, it considers how many *likes* and *comments* this content already has.
- **Time Decay Parameter** - Related to the currentness of the piece of news.

Since 2011, however, the Facebook has been using a machine-learning-based algorithm with more than 100.000 parameters, with the same objective: to guess which contents each user shall be more interested in. Recently, Twitter has migrated from a sheer chronological timeline to tweets that its users will probably like.

There are no details, but such change must have concepts similar to those of the Facebook.

In a study carried out by the University of Cornell, USA, together with the Facebook, it has been shown that intentional timeline manipulation exerts an emotional effect upon users. By showing users positive or negative news, they observed the impact of this onto the posts created afterwards.

A negative and natural effect of these algorithms, without any manipulation, within the social network is what author Eli Pariser called “*the filter bubble*”. With the purpose of demonstrating more and more what we like and/or agree with, the social network shows less and less pieces of information that might take us out of our comfort zone.

Heuristics: mental algorithms that produce abilities to judge fast with limited information.



This effect is not only restrict to the social web. Search mechanisms that customize results, such as, Google and the Bing; online shops, such as, Amazon; and even news sites that customize pieces of news according to the users' preferences have participated in the creation of the referred bubble.

Concerning cultural contents, such as, movies, music and books, the bubble effect reaches diversity. The way the algorithms work prevents what we have called *discoverability* of Internet cultural contents, that is, the potential of discovering contents.

Eli Pariser in his book *The Invisible Filter* discusses how such information restriction can affect people's creativity and how the lack of exposure to new information can prevent us from learning about the world.

Pariser's question leads us to question whether the human brain is ready to deal with the way the Internet information is structured and made available. We know there are several cognitive biases in human thinking, that is, distortions that take us to wrong conclusions in certain situations. Thus, some biases that may be potentialized by the information bubble involve the confirmation bias, the false consensus, and the group polarization.

Confirmation bias can be described as a tendency to remember, interpret, or research information in such a way as to confirm beliefs or early assumptions.

That is, we have a natural tendency to search for information that underpins what we imagine as truth. As the online filters show us information related to our "past", old ideas tend to be reinforced by these searches, since the conflicting results are avoided by the algorithm that organizes such information.

False consensus can be explained as the illusion that the majority of people see eye to eye on a certain matter, when in fact such consensus is nonexistent.

The social web, with its algorithms, tend to move away people that do not share the same likes as you do, and this can enhance the false consensus effect, for when looking at your timeline your impression will be reinforced by the confirmation bias.

The last effect with potential to be more harmful is the polarization of groups, which happens when we live together with groups that share the same viewpoints over certain issues. Thus, the Internet creates isolated bubbles between "those who agree with A" and "those who agree with B" and both groups have few connections with each other.

The information-filtering algorithms seem to be an inevitable tendency on the Internet. Therefore, I can list five practical tips on how to avoid access to information from being controlled by these filters and how we can access wider contents:

1. Search the Web through DuckDuckGo, a site especially created to avoid bubble-affected browsing; or, use Google and the Bing in the anonymous or private browser mode;

2. Social network, such as, Facebook and Twitter, allows deactivating algorithms and receiving posts in chronological order. However, the Facebook returns to the algorithm option after some time. The Instagram has not implemented an algorithm timeline yet, but it might migrate to it soon;
3. Netflix does not allow deactivating suggestions for movies and series. To avoid receiving customized suggestions, a new profile should be created. In the YouTube configurations, there seems to be no way to deactivate the suggested videos;
4. Spotify uses an algorithm to create a special music playlist for each user called *Discover Weekly*, but it seems not to alter the research results by the music listened to previously;
5. Pandora has the *Thumbprint Radio*, a radio station to listen to music liked before or similar to that. And again, it seems not to affect the researches.

The cognitive biases were born from a biological adaptation to reduce the informational load upon the brain. Now, we need to be careful not to create technological biases and not to increase the current cognitive biases.



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This article is a result of the author's ascertainment and analysis, without compulsorily reflecting CEST's opinion.