Responsabilité sociale des algorithmes

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"IF IT IS ON THE INTERNET, IT MUST BE TRUE." - ABRAHAM LINCOLN (1853)
Les algorithmes et notre société

• Les algorithmes transforment le monde : notre vie personnelle, sociale, professionnelle, l’économie, les sciences...

• Ils redéfinissent le travail, la propriété

• **L’IDÉE PRINCIPALE : NOUS SOMMES RESPONSABLES DES ALGORITHMES ET NOUS POUVONS, SI NOUS LE VOULONS, NOUS EN SERVIR POUR AMÉLIORER NOS VIES... OU PAS**

Serge Abiteboul @ CNRS
Grand pouvoir – grandes responsabilités

- Quand on a autant de pouvoir que certains logiciels qui déterminent nos vies, cela donne des responsabilités

Par exemple
- Un logiciel qui décide qui est remis en liberté conditionnelle doit être juste
- Un logiciel qui décide l’information que 95% de la population reçoit doit être neutre

- Ici : nous nous intéresserons à la science des données
- Désolé : en anglais
Promises and risks of data science

- Improve people’s lives, e.g., recommendation
- Accelerate scientific discovery, e.g., medicine
- Boost innovation, e.g., autonomous cars
- Transform society, e.g., open government
- Optimize business, e.g., advertisement targeting

Growing resentment
- Against bad behaviors: racism, terrorist sites, pedophilia, identity theft, cyberbullying, cybercrime
- Against companies: intrusive marketing, cryptic personalization and business decisions
- Against governments: NSA and its European counterparts

Increasing awareness of the dissymmetry between what these systems know about a person, and what the person actually knows
Discrimination sociale dans les prix

THE WALL STREET JOURNAL.

WHAT THEY KNOW

Websites Vary Prices, Deals Based on Users’ Information

By JENNIFER VALENTINO-DEVRIES, JEREMY SINGER-VINE and ASHKAN SOLTANI
December 24, 2012

It was the same Swingline stapler, on the same Staples.com website. But for Kim Wamble, the price was $15.79, while the price on Trude Frizzell’s screen, just a few miles away, was $14.29.

A key difference: where Staples seemed to think they were located.

lower prices offered to buyers who live in more affluent neighborhoods

https://www.wsj.com/articles/SB10001424127887323777204578189391813881534
Women less likely to be shown ads for high-paid jobs on Google, study shows

The AdFisher tool simulated job seekers that did not differ in browsing behavior, preferences or demographic characteristics, except in gender.

One experiment showed that Google displayed ads for a career coaching service for “$200k+” executive jobs 1,852 times to the male group and only 318 times to the female group. Another experiment, in July 2014, showed a similar trend but was not statistically significant.

https://www.theguardian.com/technology/2015/jul/08/women-less-likely-ads-high-paid-jobs-google-study
A commercial tool COMPAS automatically predicts some categories of future crime to assist in bail and sentencing decisions. It is used in courts in the US.

The tool correctly predicts recidivism 61% of the time.

Blacks are almost twice as likely as whites to be labeled a higher risk but not actually re-offend.

The tool makes the opposite mistake among whites: They are much more likely than blacks to be labeled lower risk but go on to commit other crimes.

European commission announces antitrust charges against Google

Inquiry will focus on accusations that internet search and tech multinational has unfairly used its products to oust competitors

Sam Thielman in New York
@samthielman
Wednesday 15 April 2015 07.27 EDT

The European Union accused Google on Wednesday of cheating competitors by distorting Internet search results in favour of its Google Shopping service and also launched an antitrust probe into its Android mobile operating system.
Lack of diversity in Social networks such as FB and Twitter

Donald Trump’s victory is blindsiding, like stepping into a crosswalk and getting slammed into by a delivery guy cycling the wrong way down a one-way street. This is because, as media scholars understand it, we increasingly live in a “filter bubble”: The information we take in is so personalized that we’re blind to other perspectives. It simultaneously explains why Trumpism has flourished and why so many of us are insulated from it.
Various aspects

• Fairness: justice, staplers case
• Neutrality: Google search
• Transparency: Google Ads setting
• Diversity: filter bubble
• Others: privacy, explicability, accountability, truth...
Future challenges in data science

An opinion:

• In the past, the field was driven by
  – Company data
  – Data model & performance & reliability

• In the future
  – **Personal and social data**
  – **Ethical issues**

**Ethics:** concepts and principles that guide us in determining what behavior helps or harms us
Issue 1: Verifying these properties

• Tools to collect data and analyze it responsibly
• Tools to verify that some analysis was performed responsibly
• Easier if responsibility is taken into account as early as possible, responsibility by design
• To check the behavior of a program, one can
  – Analyze its code ≈ proof of mathematical theorems
  – Analyze its effect ≈ study of phenomena (such as climate or the human heart)
Verification: code analysis

• Possible if open-source - otherwise auditing
• Easier with open-source
  – not sufficient: bug in the SSL library of Debian
  – Weak secrecy of keys for 2 years
• Specify properties that should be verified
• Verification based on static analysis, in the spirit of theorem proving
• Lots of work in different areas
  – security, safety, optimization, privacy
• Little on responsibility
Verification: analysis of effects

• Statistical analysis
  – Detect biases
  – Detect illegal use of protected attributes

• Verify transparency

• Verify “loyalty”
  – The system behaves like it says it does

• Example: Google Ads Settings & AdFisher
Issue 2: on-line analysis of Web data

• Fake news, alternative facts
• Nazi sites
• Terrorist sites
• Pedophiliac content
• Bogus health content
• Conspiracy theory content
• Cybercrime
• Cyberbullying ...
On-line data analysis

• 2013: A tweet from The Associated Press Twitter account claiming the White House had been bombed
• the Dow dropped more than 100 points in two minutes
• Automatic Web scale content monitoring
Conclusion

Many societal and political fights today are related to algorithms and data
The issues are clearly not only technical

Should encourage
• Collaborations between computer scientists and scientists from humanities: sociologists, economists...
• Commons and sharing: Open software, open data, open sciences
References

- [https://dataresponsibly.com/](https://dataresponsibly.com/)
- Course on **Data Responsibly**, with Julia Stoyanovich EDBT Summer school, 2017
- Tutorial on **Personal Information Management Systems** with Amélie Marian at EDBT/ICDT2015
- More references there