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## **When algorithms deceive us: notice it, explain it, prove it**

### **Abstract**

Algorithmic recommendations are part of our lives, so much they solicit us with their daily stimuli. Our teenagers receive on average more than 300 algorithmic recommendations per day, which they will decline or validate with a thumb movement, like on TikTok. This same thumb, older and overtrained, will one day be the sentimental pass to the lucky one on Tinder.

TikTok, Tinder, Deliveroo, Uber, Expedia, Booking.com, Spotify, Youtube, Google, Amazon, LinkedIn, Facebook, Instagram ... ten maybe fifteen companies in the world, often American or Chinese, feed their algorithms with hundreds of billions of traces of our interactions with them. To the second, and sometimes implicitly, without us having the feeling to consent. We are two billion humans to train them how to influence us.

But who audits these algorithms, who checks that they do not deceive us, that they respect the rules of law: competition rights, consumer rights, labor rights and that they do not discriminate against us?

After having analyzed the main families of violated rights, almost everywhere in Europe, and the associated jurisprudences, we seek to highlight the new challenges that the audit of these algorithms poses for the authorities in charge of their monitoring and regulation. We will insist on the role played by artificial intelligence and the new manipulations it allows, as well as the difficulty to audit algorithms that are both personalized and multi-dimensional.

We will discuss the main audit approaches ("in vitro" and "in vivo"), and particularly the "black box" audit with its strengths and constraints. We will illustrate, using examples from the food delivery industry, how algorithmic biases can be detected in a systematic and hopefully conclusive way. We will see how the new European regulations (DSA and DMA) open the way to a better control of the behavior of the algorithms of the large platforms in front of the citizen-consumers. We will insist on the role that academic research can play in this new eco-system of algorithmic regulation.

### **Biography**

Benoit Rottembourg leads the Regalia project at Inria, the French National Institute for Research in Digital Science and Technology. The aim of Regalia is to provide to the regulation authorities a software framework for auditing digital platform algorithms, like recommendation systems or pricing engines.

Benoit joined Inria after 20 years of analytics software development (capacity planning, industrial asset management, dynamic pricing) in the industry. From 1998 to 2005, he led the Data Science team of Bouygues, the French conglomerate, and from 2017 to 2020 he was head of customer and pricing Data Science at Maersk, the Danish maritime company. Benoit co-founded several technological start-ups in the energy and the retail sector.

Benoit holds a PhD in applied mathematics of Sorbonne-University. His research hybridizes AI with multi-stage stochastic discrete optimization.