

Algorithmic Opportunities, Transparency and Accountability

European Parliament
Brussels, 29 June 2017

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Why do we use algorithms?

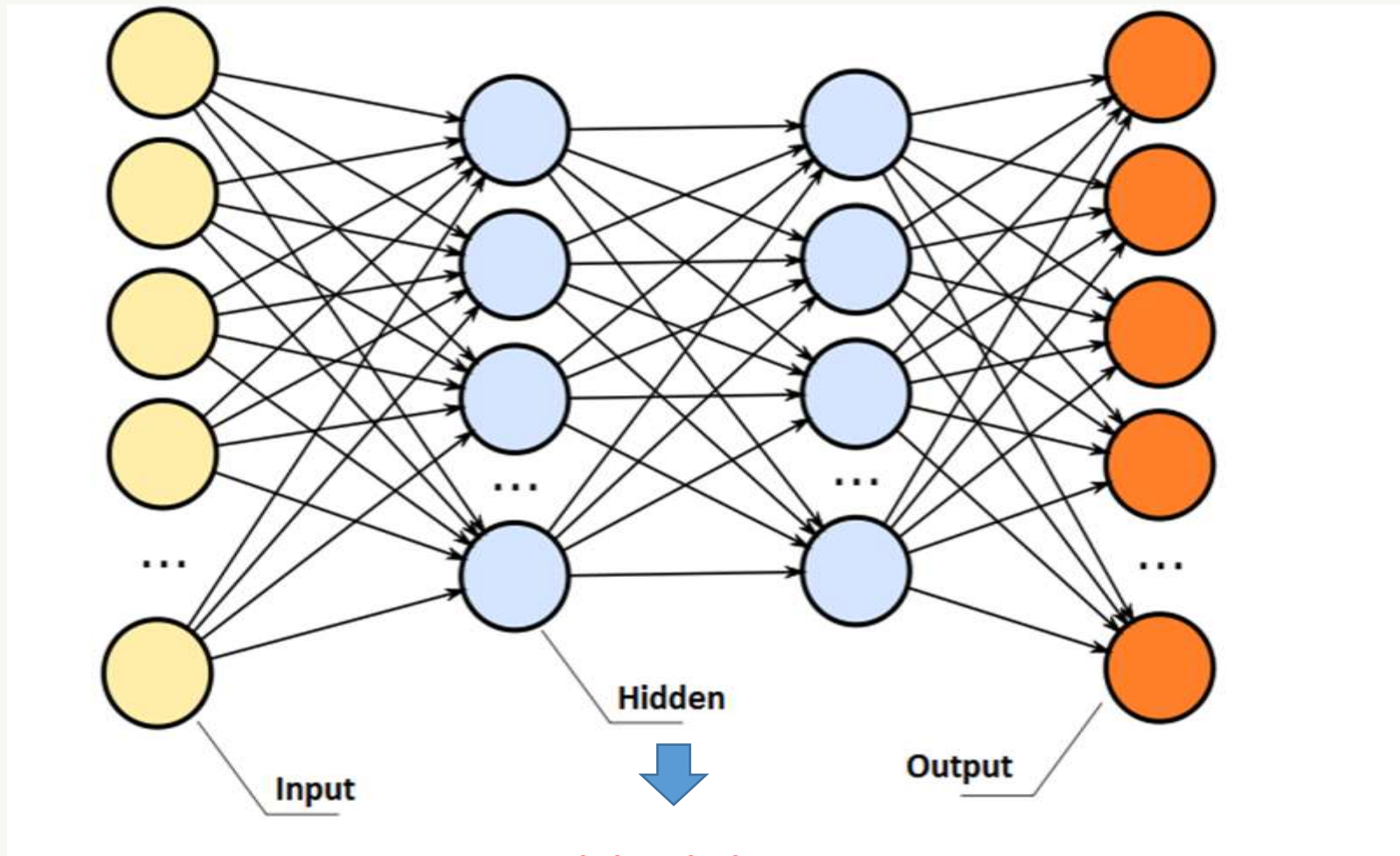
- Asymmetric information can lead to market failures (Akerlof, 1970)
- Algorithms use big data as an input to reduce information asymmetries and effectively match supply with demand
 - Allocative efficiency
 - Dynamic efficiency (e.g. Demand fluctuations)
- Challenge: Promoting fairness and overcoming the discriminatory effects

Data as an input of the algorithm

- How data is selected?
- Is it complete, correct, up-to-date?
- Is there any selection bias?
- Examples: Access to credit, hiring practices, higher education.
- In cases of unfair discrimination related to the input data, is it difficult to attribute liability?
 - Not necessarily if there is transparency.
- How can we increase transparency? The General Data Protection Regulation (GDPR) confers the “right to explanation”

Artificial intelligence algorithms

- A neuron network structure:



A black box

Artificial intelligence algorithms (2)

- Discriminatory outcomes may be the case even if input is not problematic. However, the weight the different inputs has an impact on the output
- Can we really understand the black box?
 - How can we implement the GDPR's "right to explanation"?
- How to attribute liability?
- Should we regulate algorithmic design?
- A case-by-case analysis is needed:
 - Type of discrimination: Is it an "algorithmic accident" or an intentional market strategy?
 - Price discrimination can improve welfare under certain conditions