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Algorithmic Discrimination



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A Story of Algorithmic Discrimination

One day, psychologist Miriam decided to report her husband to the police after he had repeatedly **threatened her with violence**.

She played recordings for the officers in which he literally threatened to “take away what is most precious to her in the world,” and described occasions when he had been violent toward their children.

The police asked Miriam a series of questions and entered her answers into VioGén, a software **program that estimates the risk of recurrence of gender-based violence**.

The program assessed the risk of another incident as low. When Miriam asked the judge to prohibit her husband from having contact with the children, the judge, citing among other things the **low risk calculated by the program, denied** the request.

Seven months later, her husband murdered the children and committed suicide.

Algorithmic Discrimination?



direct or indirect discriminatory
conduct based on automated decision-
making through algorithms

algorithms = a general term for a set of
computational instructions that determine output
values based on inputs

Classification of Algorithmic Decision-Making



rule-based algorithms

- example: a system that automatically issues speeding fines when speed too high

machine learning algorithms

- example: software detecting spam in incoming emails

Indicators of Algorithmic Discrimination

1

speed and scale
of discriminatory effects

2

invisible reproduction
of the human factor

3

bias in the input data

4

false
causality

5

lack of transparency
of the methods used

6

intersectionality

Indicators of Algorithmic Discrimination

1

speed and scale
of discriminatory
effects

Examples:

- profiling job applicants
- distribution of social benefits

Challenges:

- failure to take into account **specific circumstances** and the **individuality** of the person
- the error is applied to the **entire data sample**
- increased risk of harm due to multiple data files

Indicators of Algorithmic Discrimination

2

invisible reproduction
of the human factor

Challenges:

- they reflect and **amplify bias** in decision-making
- they are not neutral nor apolitical
- they are influenced by both the input data and the developers' specific design

Example:

- denial of a loan based on demographic characteristics rather than actual financial circumstances

Indicators of Algorithmic Discrimination

3

bias in the
input data

Challenges:

- the quality of inputs affects the quality of outputs
- trouble of inaccurate, incomplete, or **biased input data**
- using datasets for a purpose other than their intended one (***transfer learning***)
 - false model predictions -- false correlations and results

Indicators of Algorithmic Discrimination

Challenges:

- the problem of **proxy variables** (= substitute, and often also discriminatory, indicators)
- machine learning based on identifying correlations, **not on understanding causality** (i.e. cannot explain why it made a decision or on what exact basis it produced a given result)

4

false
causality

Indicators of Algorithmic Discrimination

- systems evolve over time — **discrimination** against a group or an individual **may occur** only once or **randomly**; difficult to prove
- the problem of **computational irreducibility** in complex operations – impossible to explain how the machine arrived at a given result

5

lack of transparency
of the methods

- **alignment faking**
and other challenges

Indicators of Algorithmic Discrimination

Challenges:

- not only the magnitude + quantity, but also the interconnection of different grounds for discrimination
- significantly greater impact on certain categories of people than the others
- example: wearing religious symbols in schools; inheritance pension for registered partners only after reaching a certain age



Challenges faced by Victims of Algorithmic Discrimination

1. Recognize it

- The victim often doesn't even realize that the decision was based on algorithmic decision-making
- The system is unable to explain how it reached a given conclusion (and often neither can the experts)

2. Prove it

- Not possible to perform an effective retrospective analysis of computational reasoning
- Machine reasoning can change and evolve over time

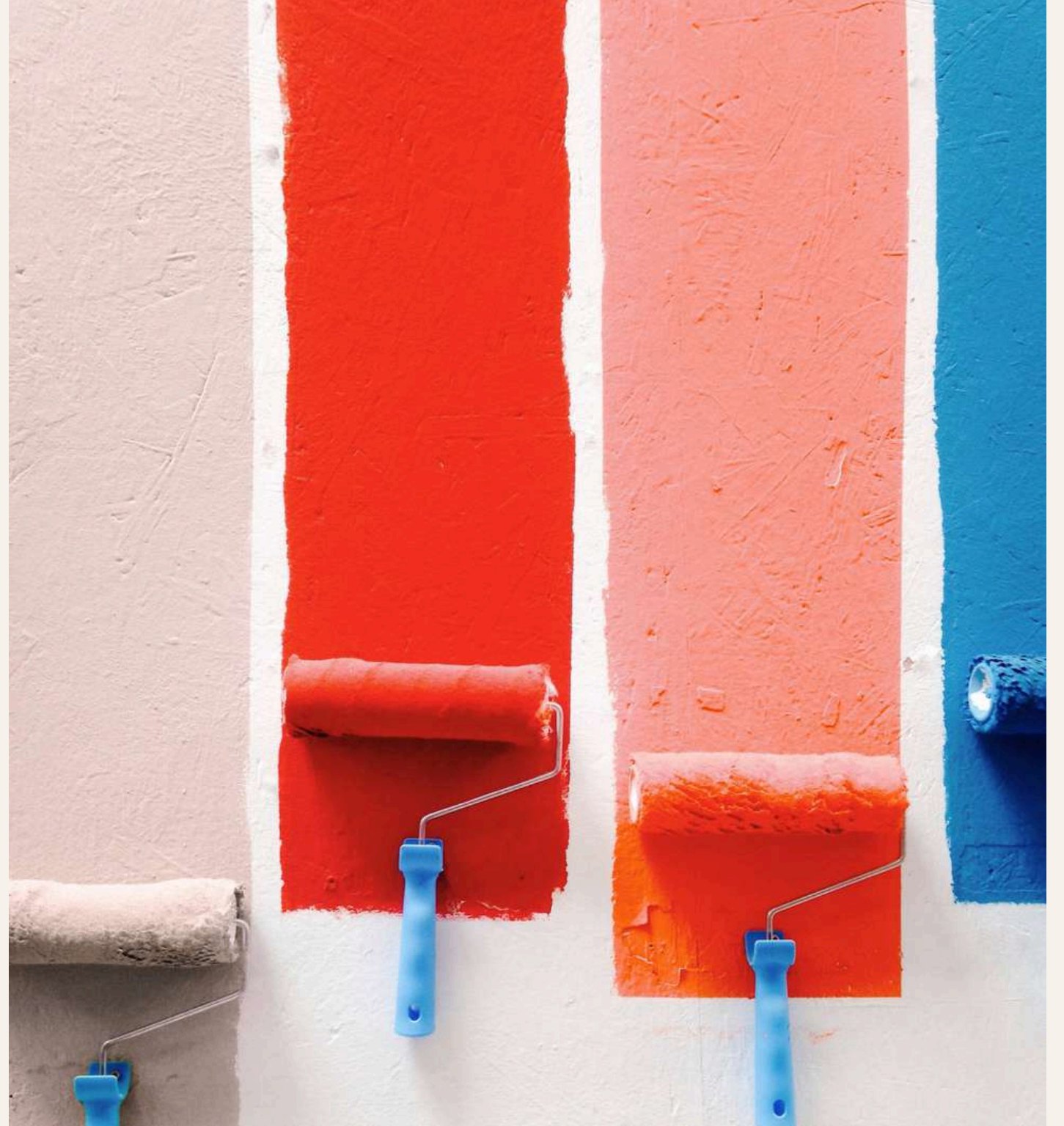
3. Identify Liability

- Development and training – supervision – implementation – system deployment – specific application and results
- Many different parties involved in the process



Regulatory Framework

quick
overview



Algorithmic Discrimination and the Regulatory Framework

1

European Convention
on Human Rights
and Protocol No. 12

2

International
Covenant on Civil
and Political Rights

3

Charter of Fundamental
Rights of the
European Union

4

EU AI Act
+ DSA Regulation

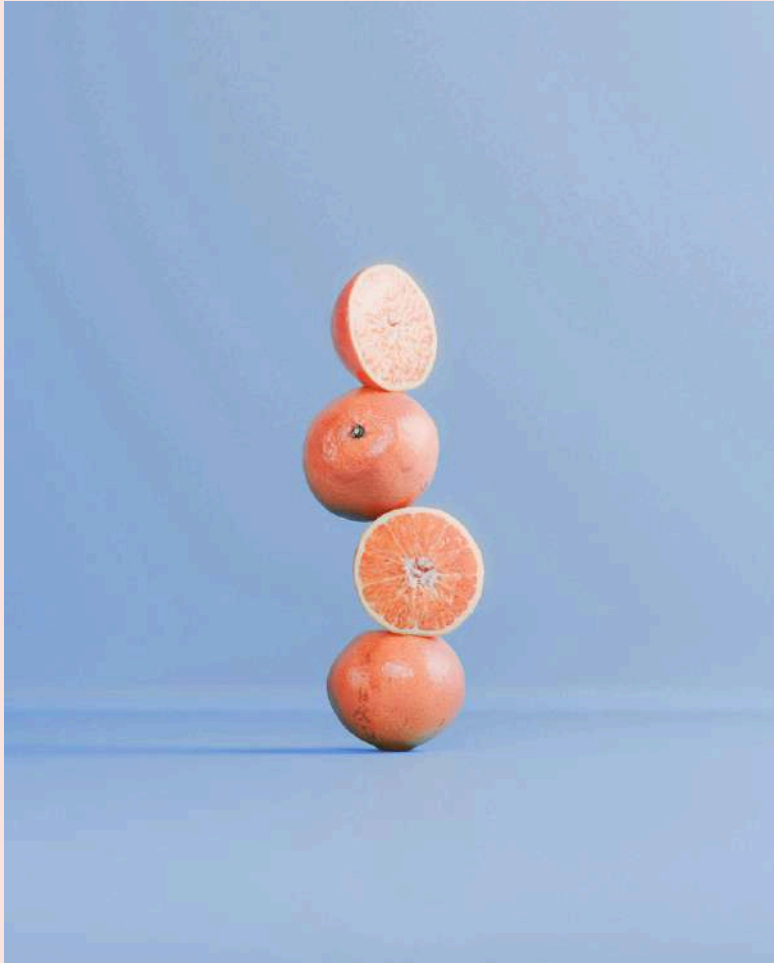
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Council of Europe
Framework Convention
on AI and
Human Rights

6

EU Directive on Representative
Actions for the Protection
of Consumers' Collective
Interests

Summary and Possible Ways Forward



Summary

- a new form of discrimination, however still application of existing regulations
- lack of transparency in the process; proxy indicators
- current concepts of direct and indirect discrimination insufficient to address intersectionality
- victims: burden of proof, trade secrets of companies, black box technology, lengthy proceedings, weak position

Ways forward?

- collective action by victims of discrimination
- involvement of authorities – ombudsman, DSA regulator, NGOs, unions
- appropriate regulation, pressure on corporations

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Thank you for your attention

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