Are PETs and Algorithmic Accountability at loggerheads?

Anders Dalskov & Kris Shrishak

HotPETs 2023

Partisia

Irish Council for Civil Liberties

MPC

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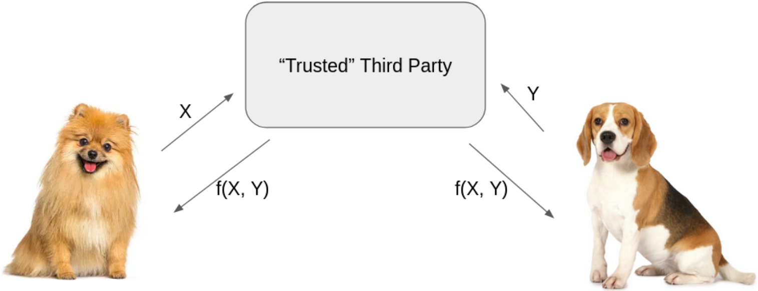

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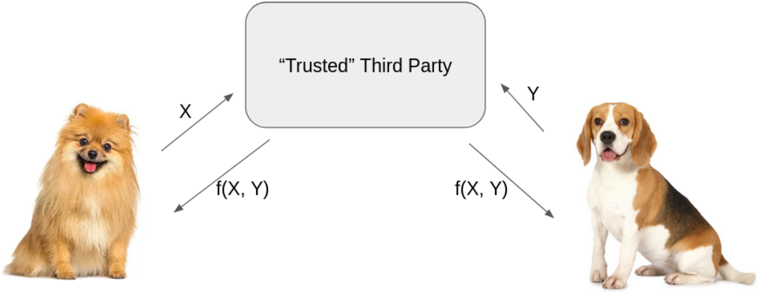

Clearly private and correct, provided the "trusted" third party is actually trusted

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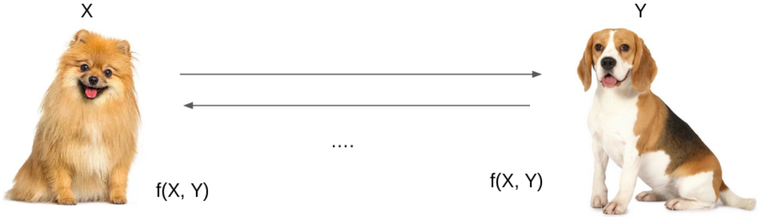

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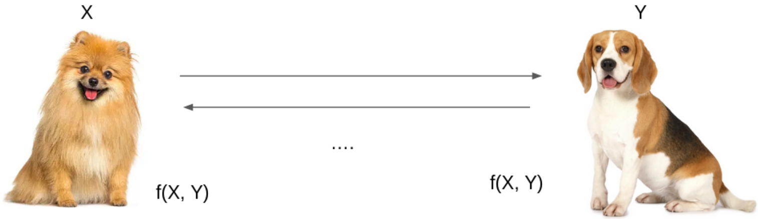

Provides the same guarantees as if there was a trusted party :)

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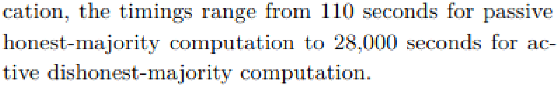
Practicality depends on the flavour. e.g.,



cation, the timings range from 110 seconds for passive honest-majority computation to 28,000 seconds for active dishonest-majority computation.

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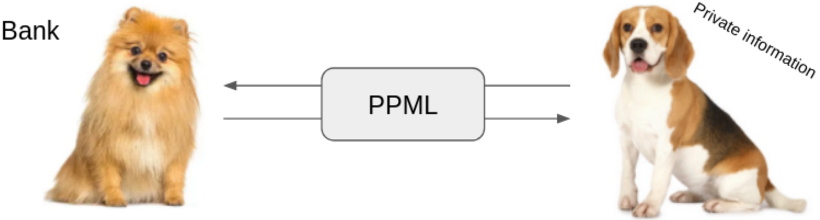

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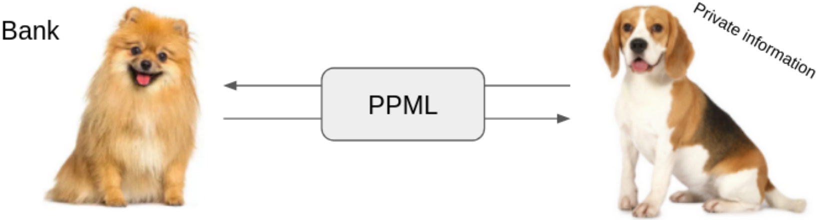

The customer doesn't trust the bank with all its private information, so it resorts to PPML.

Algorithmic Accountability (AA)

Algorithmic Accountability is about an obligation to report, explain or justify the outputs of an algorithm[1]

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"*The algorithm did it*" is not an acceptable response when the "AI" misbehaves

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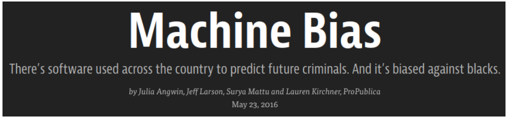

Machine Bias

There's software used across the country to predict future criminals. And it's biased against blacks.

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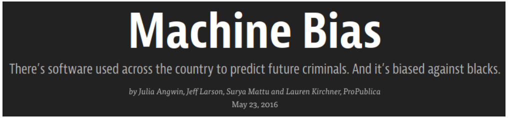

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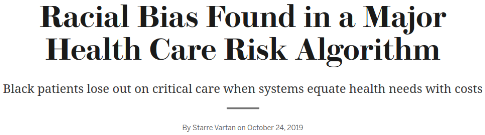

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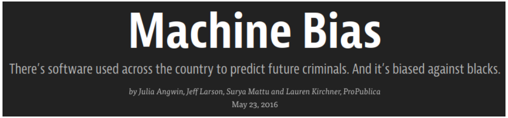

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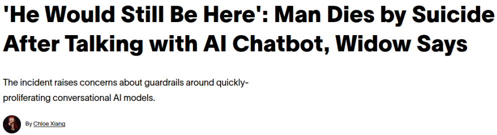

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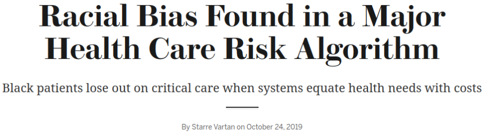

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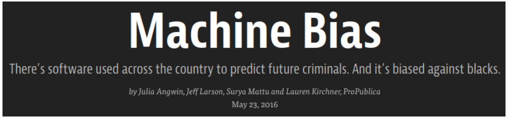

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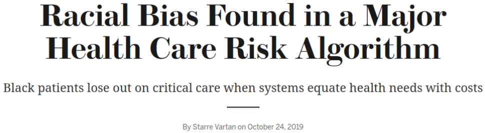

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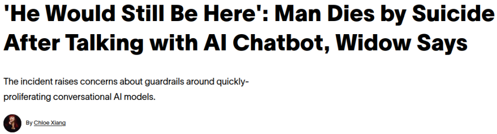

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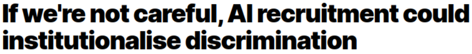

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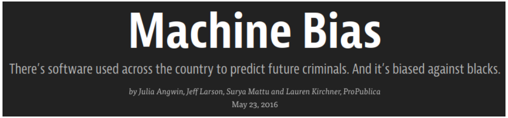

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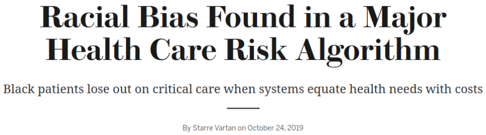

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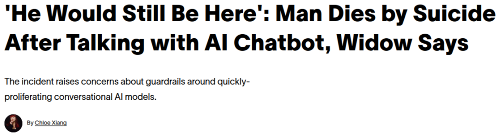

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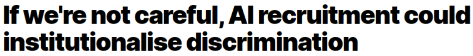

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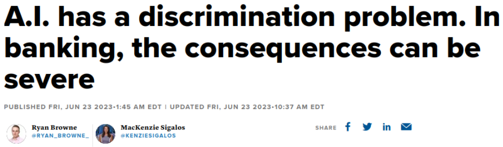

A.I. has a discrimination problem. In banking, the consequences can be severe

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Ryan Browne @RYAN_BROWNE_

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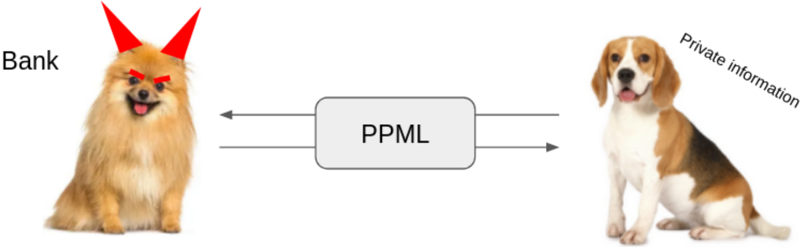

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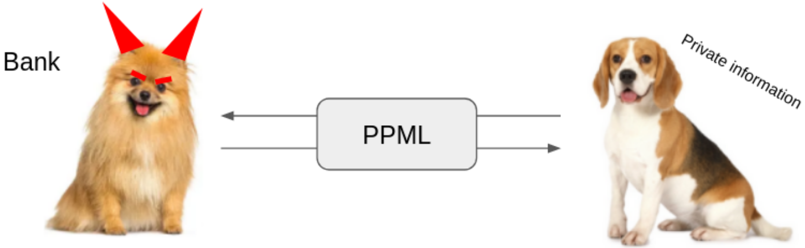

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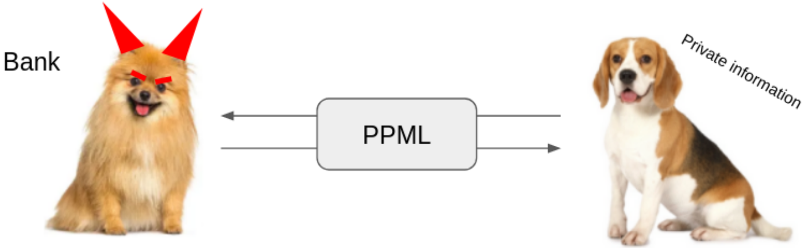

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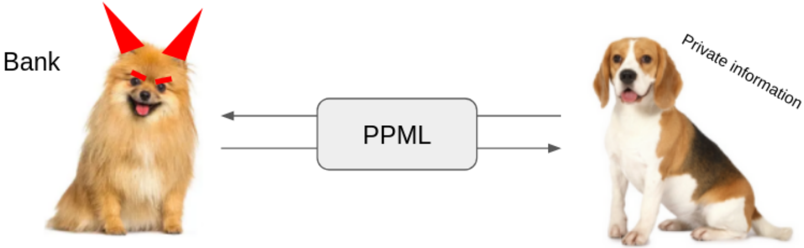

Bank

PPML

Private information

So we’re good, right? Privacy yes.
But what if the goal of the adversary is to discriminate against the customer?

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We now have to perform a secure computation that does

$$y = \mathsf{EvalButOnlyIfModelIsGoodAccordingToGoodThatAgreesWithThreatModel}([M], [x])$$

Prior research

The apparant clash between privacy and AA have been observed before

- *An Adversarial Perspective on Accuracy, Robustness, Fairness, and Privacy: Multilateral-Tradeoffs in Trustworthy ML* (IEEE Access 2022)
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And others attack this issue, but from the “wrong” direction

- *Planting Undetectable Backdoors in Machine Learning Models* (FOCS 2022)

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- Is this a PPML only issue?