

Ex Machina: Policy Challenges for the Age of Algorithms

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**The online copyright infringement saga
taught us a lesson:**

**by deferring decision-making to an
algorithm, you can escape liability...
... and governments have no easy
counter-strategy**

In cyberspace: code, not law, defines what's possible

Lawrence Lessig (1996 onwards)

The Google saga should teach us a lesson:

- Search engines make decisions!**
- They cannot be neutral, otherwise they would be useless!
And they would be made non-neutral by their rivals**
- They cannot be held responsible, unless one proves that someone intentionally programmed them to cause damage**
- No suitable remedy has been identified by any government**

Beyond Google Search: Facebook Messenger bots



“We think you should be able to message a business like you would message a friend.”

- Mark Zuckerberg



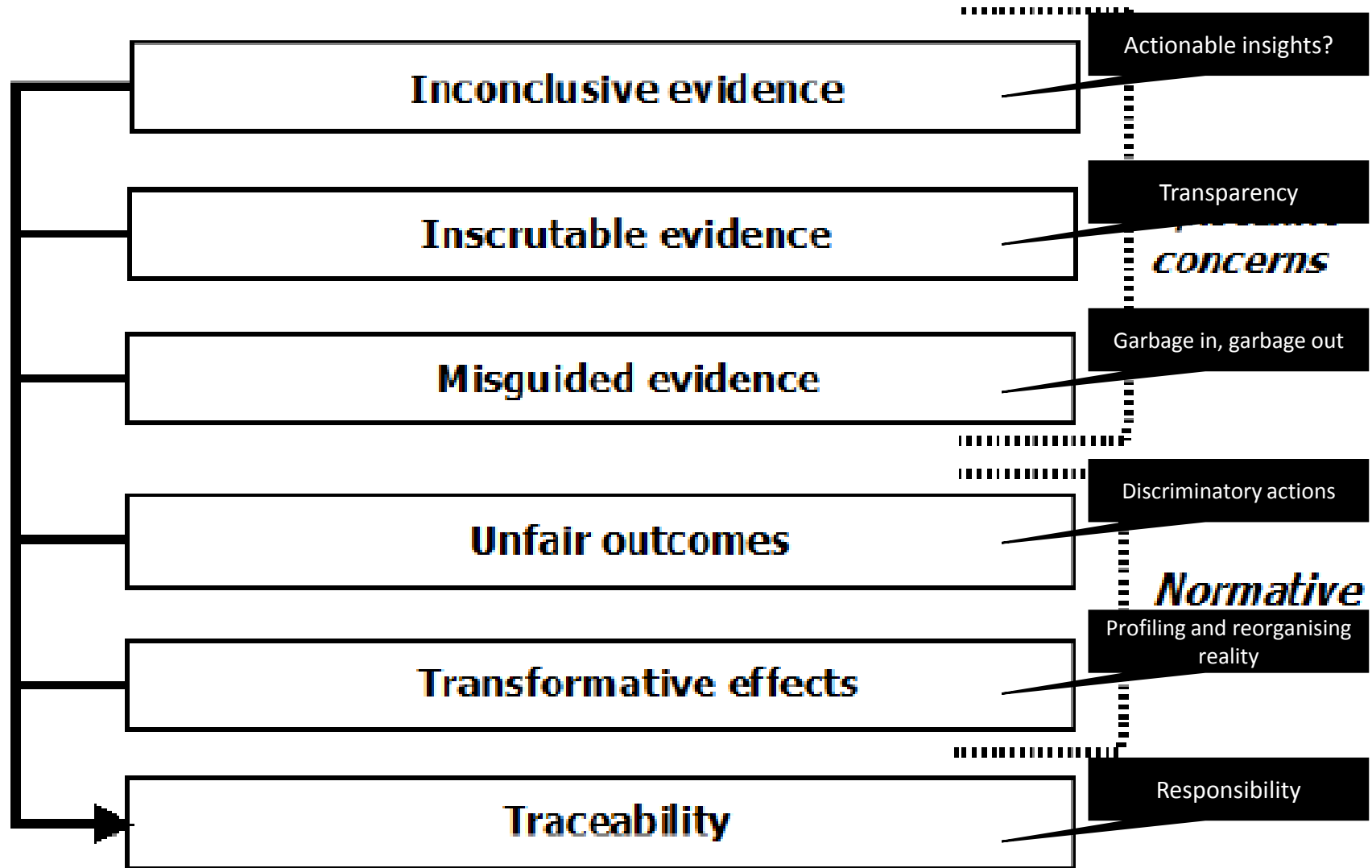


Figure 1 - Six types of ethical concerns raised by algorithms

Altruistic Donor

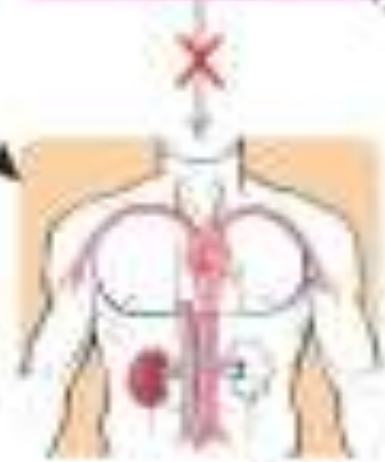
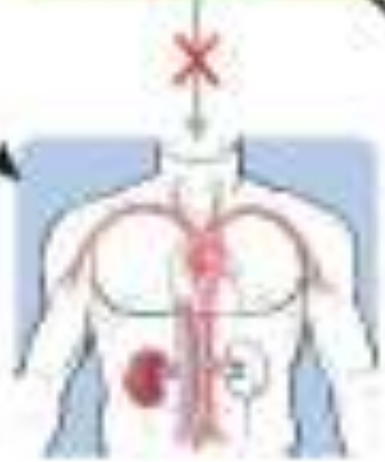
Pair A

Pair B

Pair C

Incompatible Donor

Recipient



CCF
© 2011



Making decisions...





Mercedes's Self-Driving Cars Will Kill Pedestrians Over Drivers

Mike Brown | October 14, 2016 | Autonomous Cars

When Mercedes-Benz starts selling self-driving cars, it will choose to prioritize

Building the “digital panopticon”



US009100400B2

(12) **United States Patent**
Lunt

(10) **Patent No.:** **US 9,100,400 B2**

(45) **Date of Patent:** ***Aug. 4, 2015**

(54) **AUTHORIZATION AND AUTHENTICATION
BASED ON AN INDIVIDUAL'S SOCIAL
NETWORK**

(58) **Field of Classification Search**
None
See application file for complete search history.

(75) **Inventor:** Christopher Lunt, Mountain View, CA
(US)

(56) **References Cited**

(73) **Assignee:** Facebook, Inc., Menlo Park, CA (US)

U.S. PATENT DOCUMENTS

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

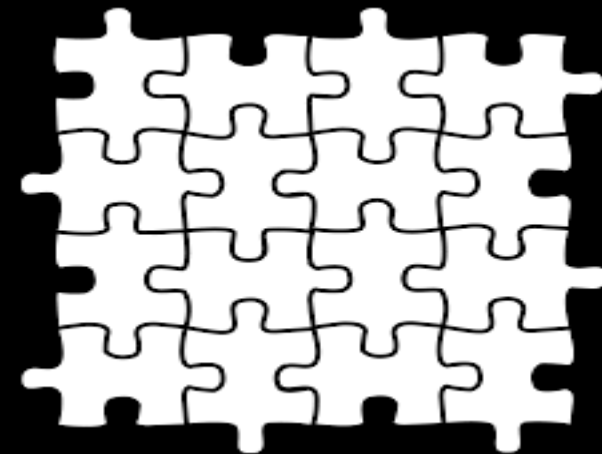
5,950,700 A	9/1999	Sudai
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Key ethical challenges

- Should algorithms reflect the biases in contemporary society? (so-called “white guy problem”)
- Should algorithms be fairer than we are?
- Should algorithms be reprogrammable by their users to incorporate their preferences?
- Should algorithms be interpretable and transparent to their users?

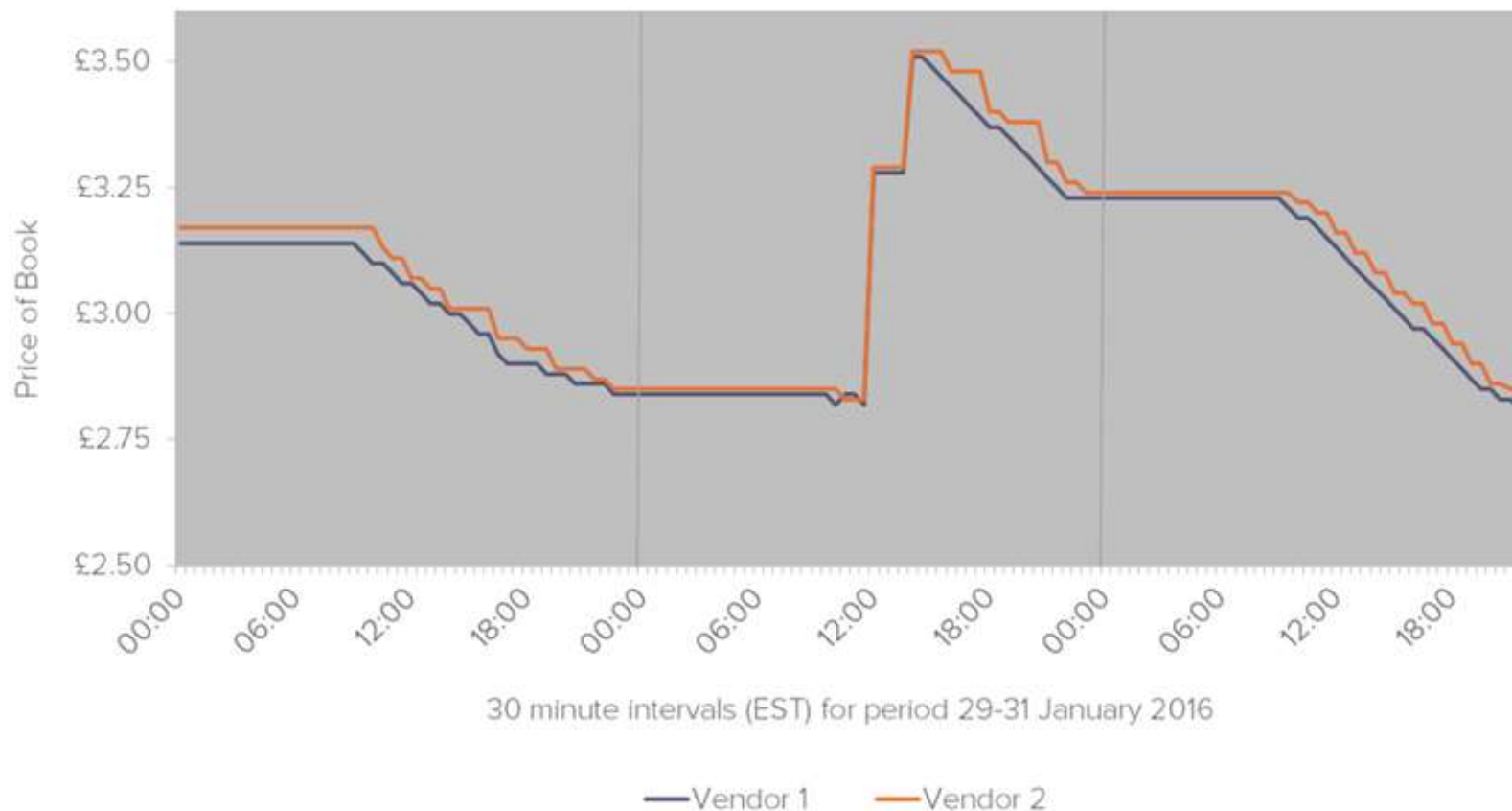
Competition puzzles

- Algorithm is (IP-protected) secret
- Algorithm is used to discriminate (?)
- Public authority imposes a change in the algorithm to enforce legal rules
- The algorithm is changed twice a day..
- .. And public authority cannot observe changes.



Perfect competition, or perfect collusion?

Prices offered for book by two vendors on a book selling platform



Algorithm interaction

The making of a fly..



\$23 million!!

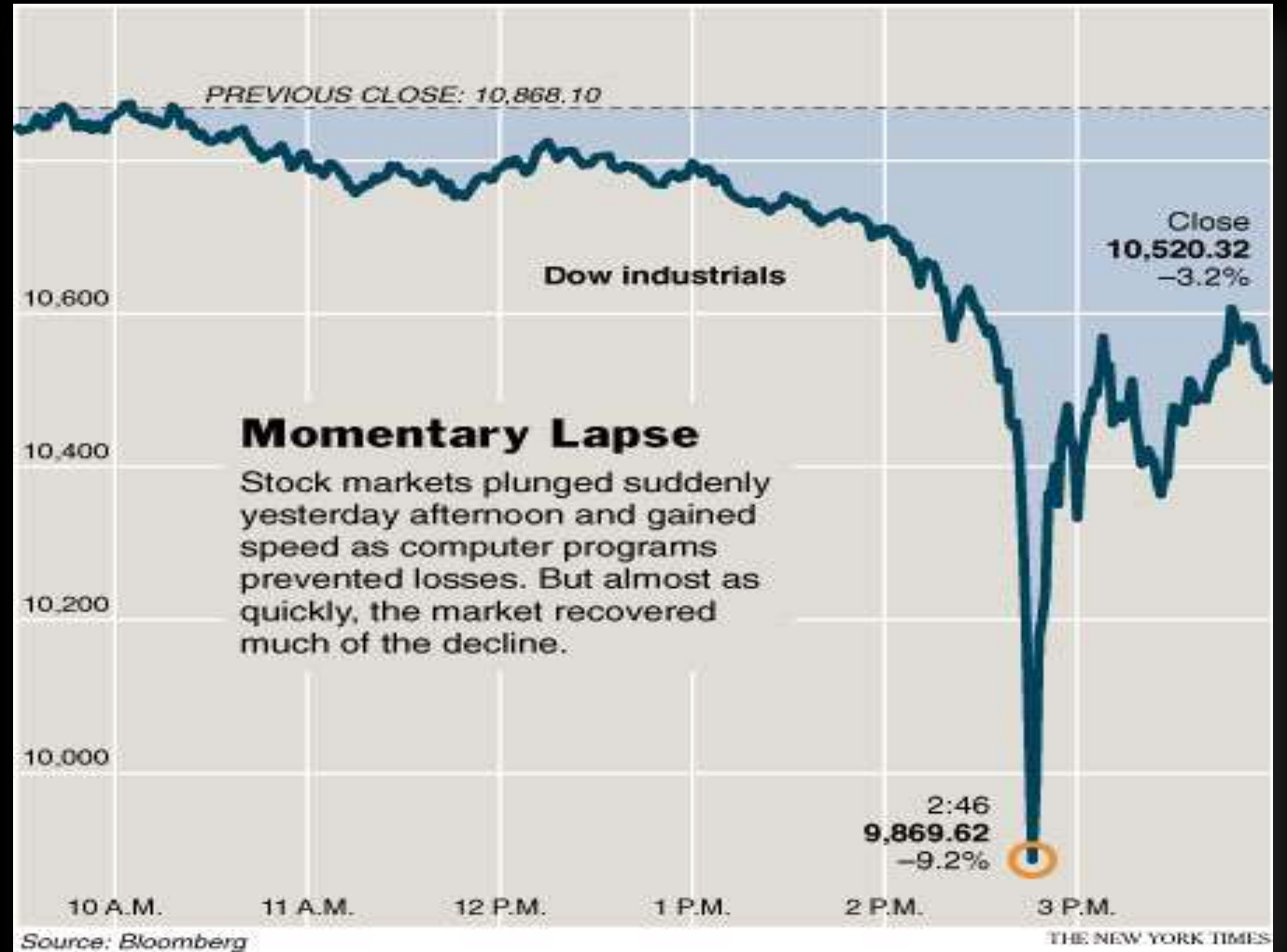
Who is responsible?



“Flash crash of 2.45”

- 9.2%!

Who is responsible?



Collective (ir)responsibility?

BlockChain



Collective oversight?

- ***Quis custodiet ipsos custodes?*** Humans are not well placed to control AI due to various issues:
 - **Privacy and confidentiality constraints**
 - **AI systems are (self-learning) systems, evolve over time**
 - **Algorithms adjust instantly, and law enforcers don't**
 - **Algorithms that support consumers and citizens are less likely to be developed than profit-motivated ones**