



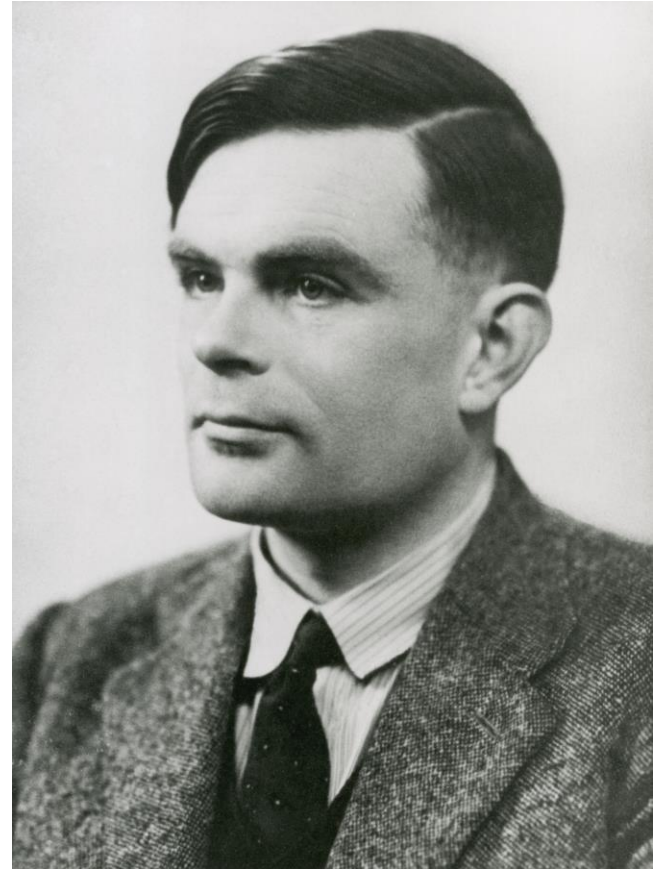
Artificial Intelligence

A Gentle and Critical Introduction

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What is AI?



Alan Turing, 1912-1954

Mind-body dualism



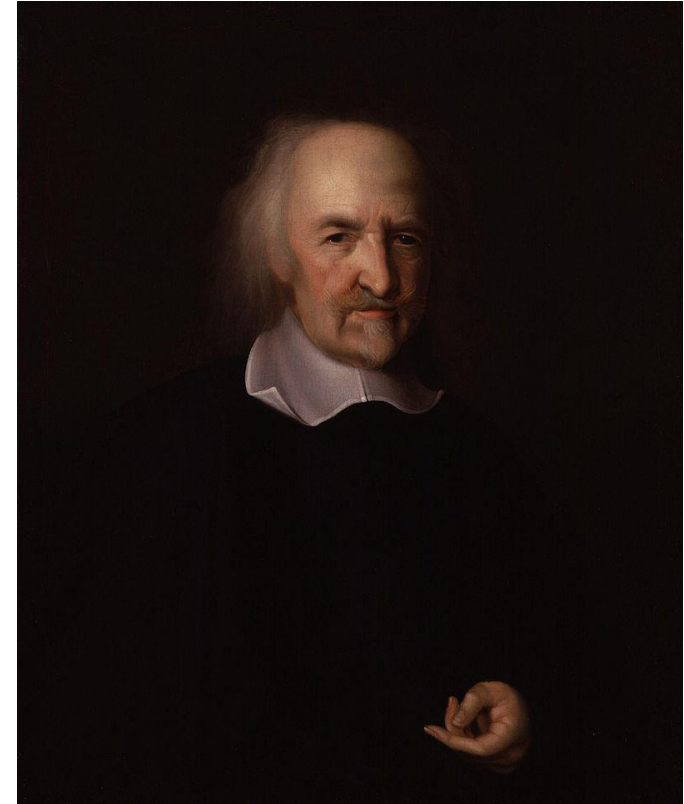
Rene Descartes (1596 - 1650)

Human Reasoning through Machines!



Gottfried Leibniz, 1646-1716

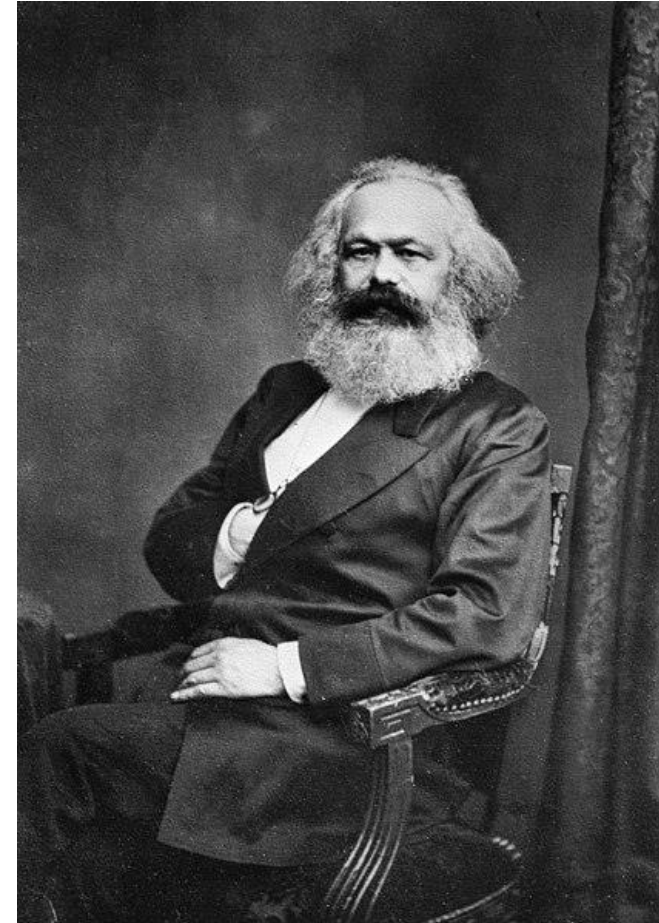
Reasoning is
nothing but
reckoning



Thomas Hobbes, 1588 - 1679

“Once adopted into the production process of capital, the means of labour passes through different metamorphoses, whose culmination is the... automatic system of machinery... set in motion by an automaton, a moving power that moves itself; this automaton consisting of numerous mechanical and intellectual organs, so that the workers themselves are cast merely as its conscious linkages.”

“The Fragment on Machines”, 1857-58



Karl Marx, 1818 - 1883

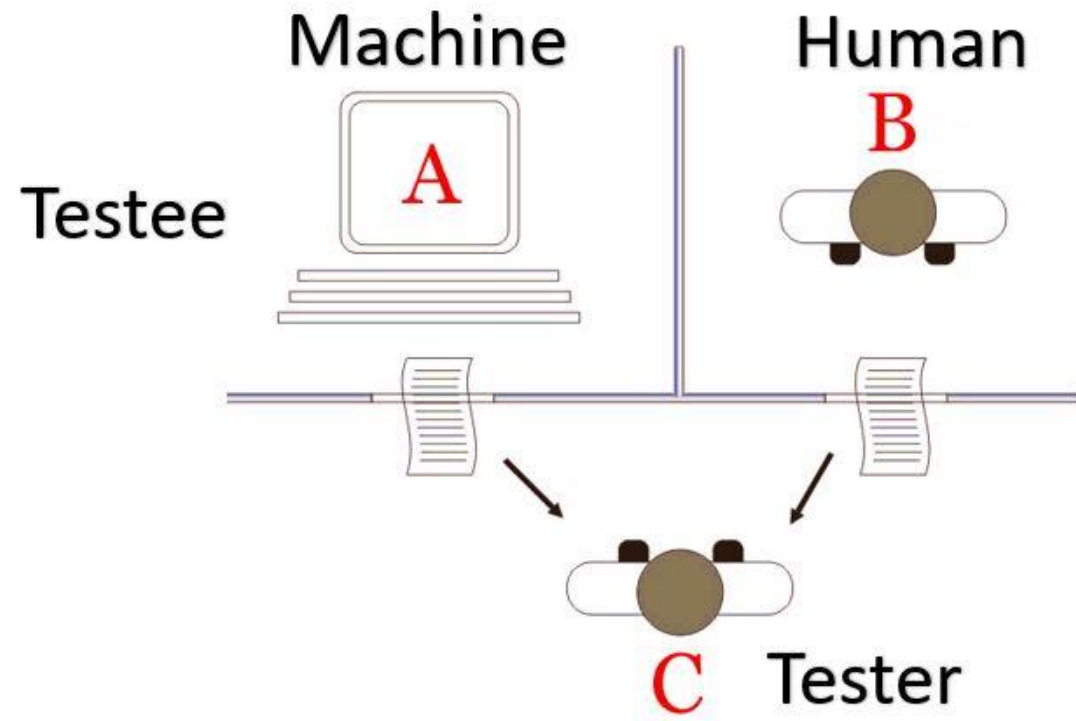
The division of labour suggests the contrivance of tools and machinery to execute its processes. When each processes, by which any article is produced, is the sole occupation of one individual, his whole attention being devoted to a very limited and simple operation, improvements in the form of his tools, or in the mode of using them, are much more likely to occur to his mind, than if it were distracted by a greater variety of circumstances.

On the economy of machines and manufactures, 1832



Charles Babbage, 1791-1871

Turing Test



We propose that a two-month, ten-man study of artificial intelligence be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire



John McCarthy Marvin Minsky Claude Shannon

Eliza (1964-66) The first ever chat bot

Welcome to

```
EEEEEE LL      IIII  ZZZZZZ  AAAAA  
EE      LL      II    ZZ      AA  AA  
EEEEEE LL      II    ZZZ     AAAAAA  
EE      LL      II    ZZ     AA  AA  
EEEEEE LLLLLL IIII  ZZZZZZ  AA  AA
```

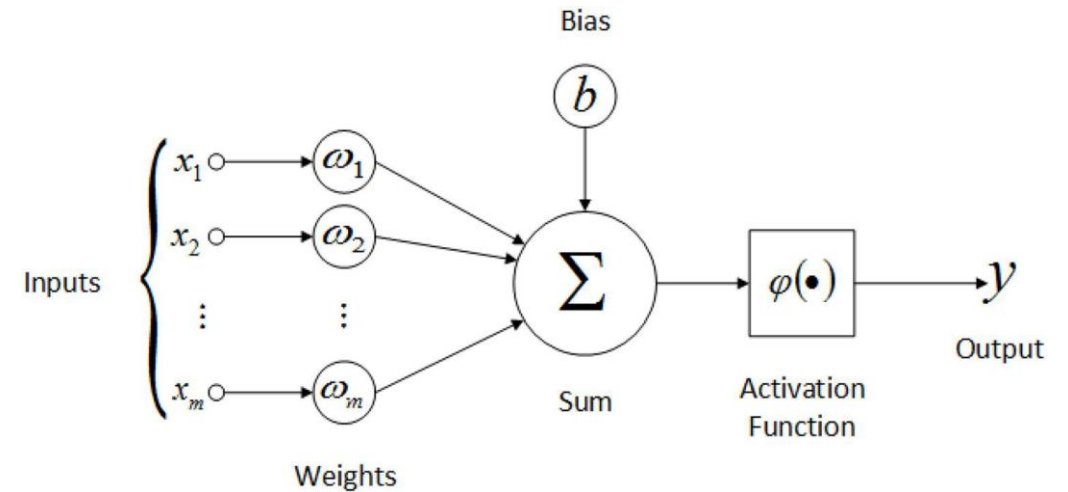
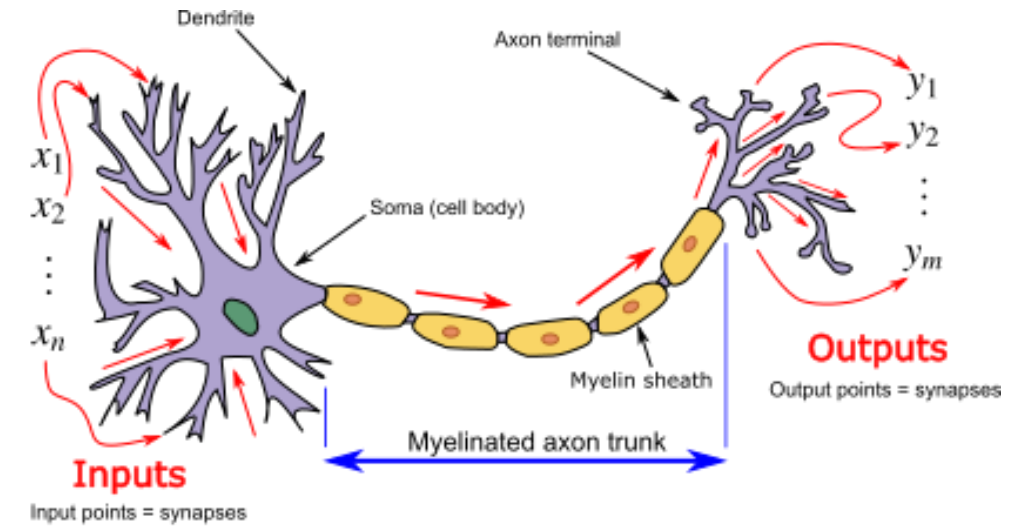
Eliza is a mock Rogerian psychotherapist.
The original program was described by Joseph Weizenbaum in 1966.
This implementation by Norbert Landsteiner 2005.

```
ELIZA: Is something troubling you ?  
YOU:   Men are all alike.  
ELIZA: What is the connection, do you suppose ?  
YOU:   They're always bugging us about something or other.  
ELIZA: Can you think of a specific example ?  
YOU:   Well, my boyfriend made me come here.  
ELIZA: Is it important to you that your boyfriend made you come here ?  
YOU:   He says I'm depressed much of the time.  
ELIZA: I am sorry to hear that you are depressed.  
YOU:   It's true. I am unhappy.  
ELIZA: Can you explain what made you unhappy ?  
YOU:
```



"it is comparatively easy to make computers exhibit adult level performance on intelligence tests or playing checkers, and difficult or impossible to give them the skills of a one-year-old when it comes to perception and mobility"

Neural Networks!



Backpropagation

Proposed 1970
Used in ANN 1980s

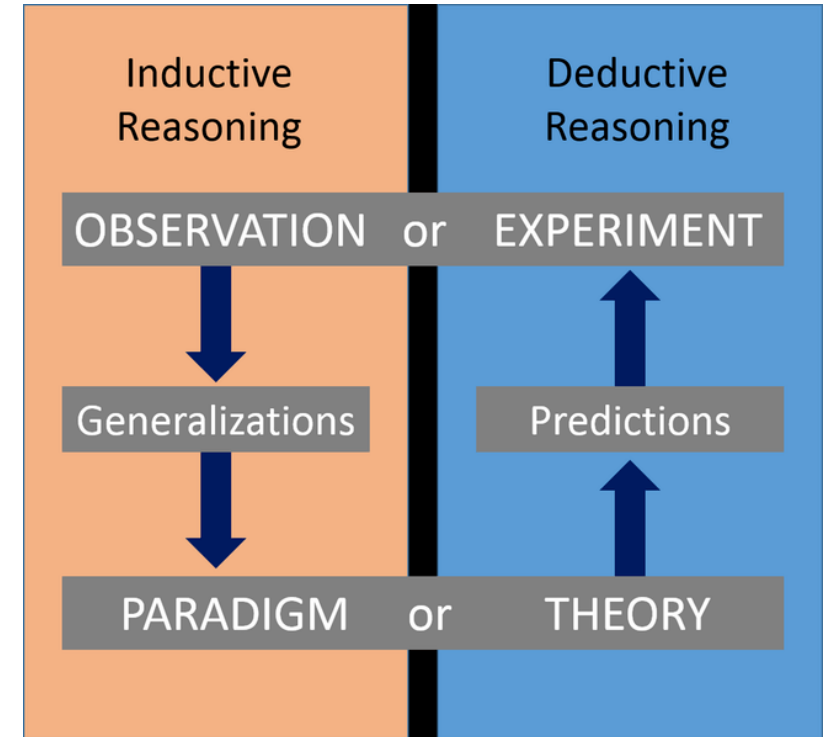


Seppo Linnainmaa, 1945 -



Deep Blue, 1997

AI: The search for an ultimate induction machine



Machine Learning Today's AI

Data-driven Algorithms



3



2



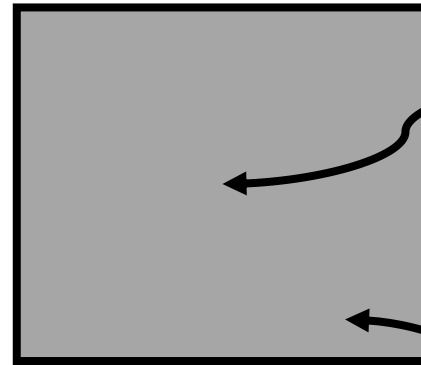
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3



3

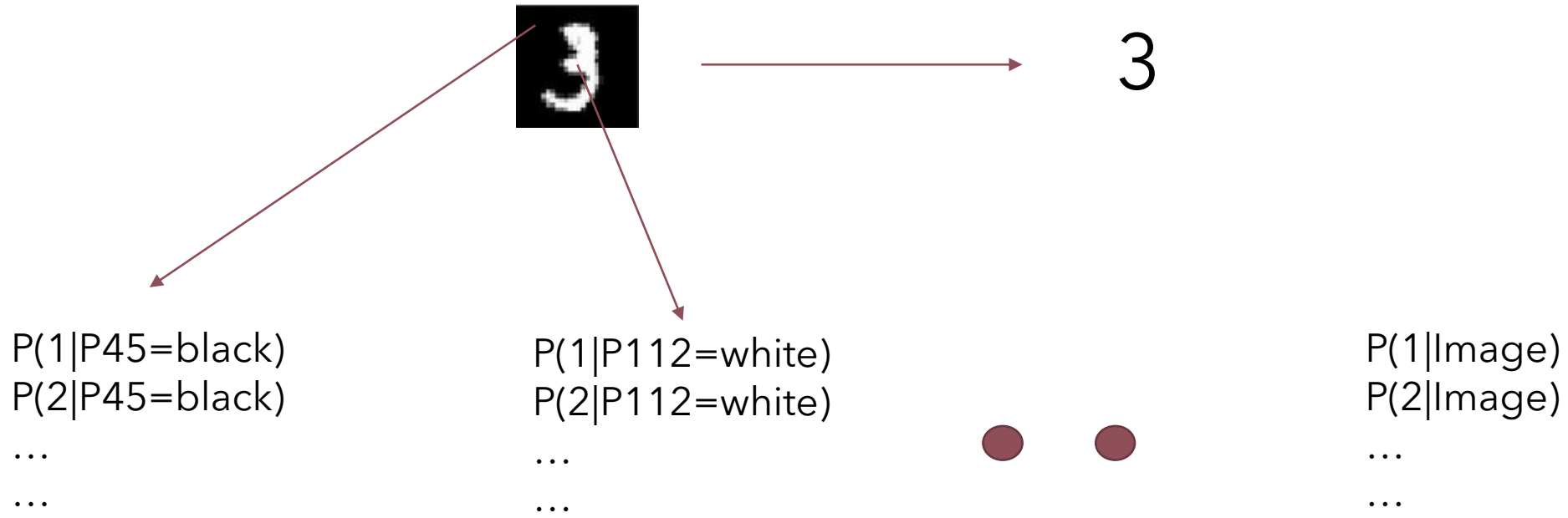


Statistical Model

Among 40 images where this point is white, 35 were tagged as "3"

Among 10 images where this point is white, 10 were tagged as "2"

Using the Statistical Model



Neural Networks

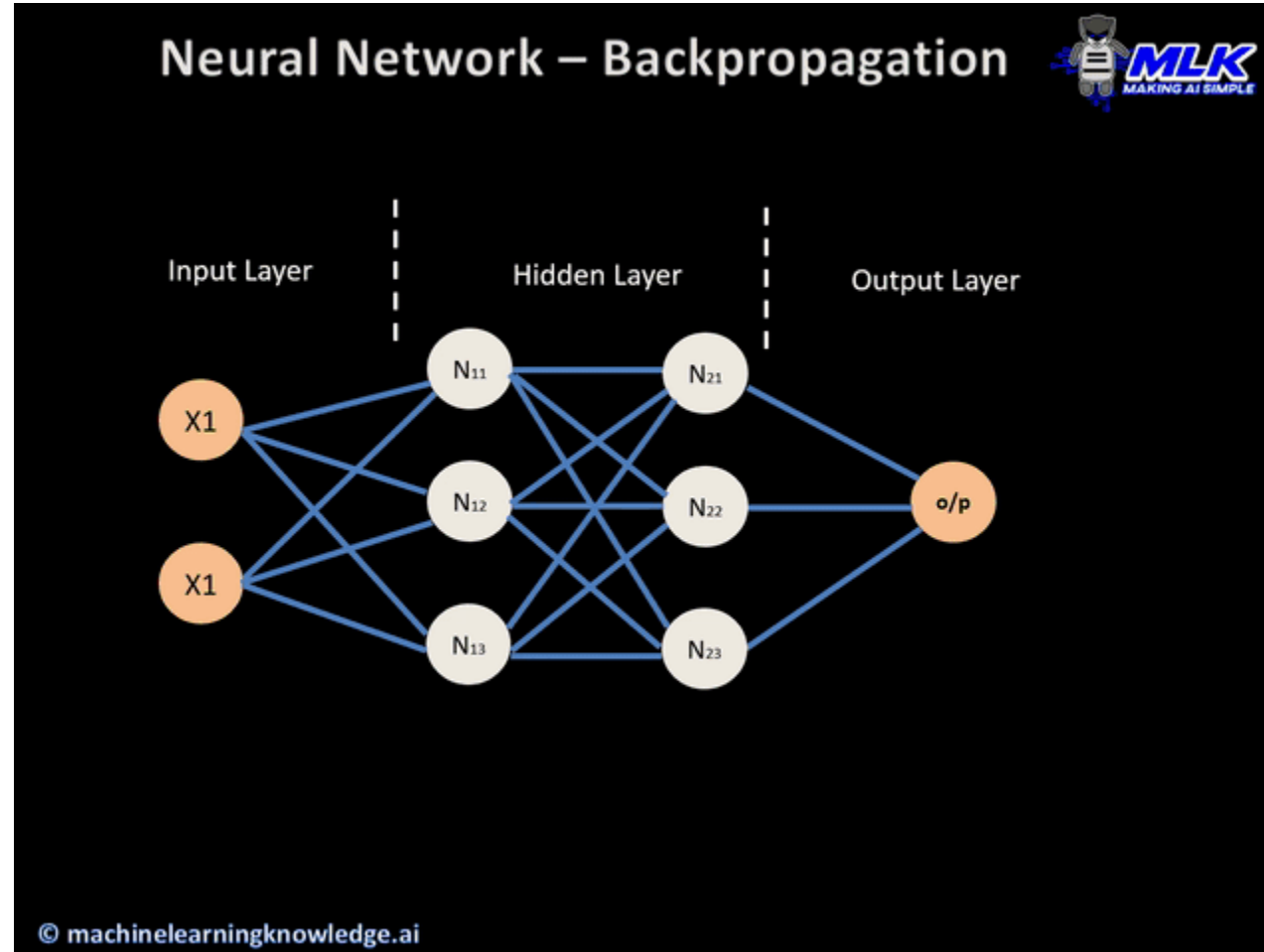


Illustration of Simple Data-driven AI

Training Data



Non-Suspicious



Suspicious



Statistical
Model

Suspicious

The Ways of AI

Least Effort Tendency



From N.K. Jemisin to We Are the ...
wired.com



Most Impactful Books to Read in 2018 ...
inc.com



Top 10 Books Every College Student ...
elearningindustry.com



Cruel calculator will tell you how many ...
itihub.com



Bestselling Books of the Decade ...
rd.com



Why Don't I Read All My Books ...
itihub.com



Tips for buying used books during the ...
theknow.demopost.com



6 Long, Absorbing Books to Get You ...
nytimes.com



Eleven Books to Read in 2019
longreads.com



The 20 books Brits lie about reading ...
independent.co.uk



Should books include credits lik ...
theguardian.com



Reading Books From Different Genres ...
writingcooperative.com



Logitech G PRO Gaming ...
logitech.com



Amazon.com: Gaming Hea...
amazon.com



Headset Gamer Logitec...
amazon.com.br



Headset Gamer Sem Fl...
logitechstore.com.br - In ...



Cloud Stinger - Headset confor...
hypergaming.com - In stock



Fone Headset Conector RJ09 ...
fonetech.com.br - In stock



Headset Gamer Corsair HS35 ...
terabyte.com.br - In stock



Fnatic REACT Wired SL...
bestbuy.com - In stock



EncorePro 300 Series - ...
poly.com - In stock



Headset Gamer Husky Snow ...
kabum.com.br



Novo Alienware 7.1 Gaming Headset ...
dell.com



Headset Logitech Gaming G5...
lgtec.com.br - In stock



Headset Gamer Fallen Morce...
fallenstore.com.br - In stock



Headset Gamer Trust Rana, P...
terabyte.com.br - In stock



HEADSET GAMER RGB FORT...
fbtooc.com.br - In stock

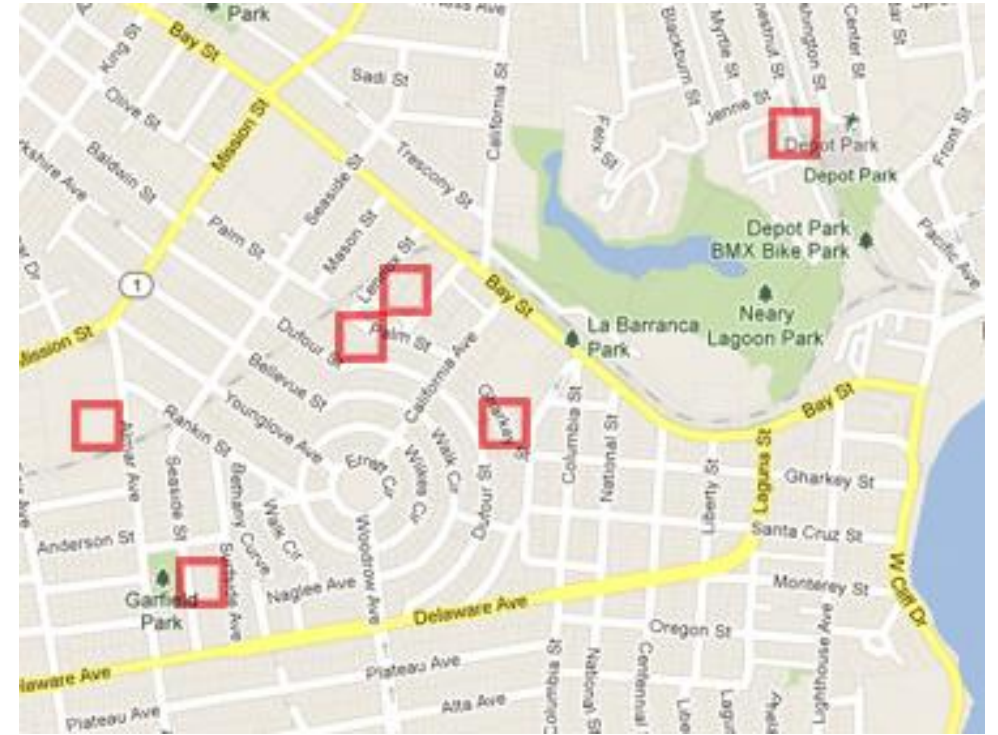


Headset Gamer EDIFIER G2II ...
lojaedifer.com.br - In stock



L-Series Wired Gaming Hea...
gamestop.com - In stock

History Repeats Itself



Data Distribution & Fairness

Gender Classifier	Female Subjects Accuracy	Male Subjects Accuracy	Error Rate Diff.
Microsoft	89.3%	97.4%	8.1%
FACE++	78.7%	99.3%	20.6%
IBM	79.7%	94.4%	14.7%



Media Lab

Generalization and Anti-minority Behavior



Simple Models and Bias

Gen.	Marks
M	68
M	65
F	55
F	56
M	70
M	67
M	69

→

Average
64.28

Averages
M:67.8
F:55.5



Biased Training Data



AI & Public Sector: Considerations

- Is imitation of outcomes (vs. imitation of process) acceptable?
- How does a fundamentally data-first approach sit with considerations of inclusiveness?
- How does an absence of theory work in complex situations?

Questions / Comments

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