

# CS6120: Lecture 7

## Homework & Exams

Kenneth Church

<https://kwchurch.github.io/>

# The Easy, the Hard and the Ugly

Kenneth Church

Northeastern University  
San Jose, CA, USA

## ➤ Easy: Exciting Eco-system

➤ **Prompting**, Inference, Fine-Tuning

## ● Hard: Limited to large companies

- Pre-training

## ● Ugly: Responsible AI

- Bias, Toxicity
- Misinformation
- Hallucinations
- Plagiarism



- Prompt Engineering:
  - Super-Popular (100+ million users)
    - Most successful (rapid) adoption of any web app ever
  - Super-Easy
    - Easier than Fine-Tuning (and Inference)
  - Use Cases
    - “Helping” with homework:
      - Cheating (?)
    - Documentation:
      - Alternative to stack overflow

# • “Helping” with homework: Cheating (?)

- **Collaborate** with students on essays
  - You have no idea how much we're using ChatGPT
  - Cheating?
- ChatGPT is better for some tasks
  - Good: thesis statements, outlines
  - Bad: capture student's voice
  - Worse: quotes
- Learning opportunity:
  - How to decompose writing to subtasks
  - Collaboration is great,
    - but student is responsible for end-product



# Replacing Stack Overflow with ChatGPT



faiss ERROR: Could not find a version that satisfies the requirement faiss



The error message "ERROR: Could not find a version that satisfies the requirement faiss" indicates that the Python package manager (likely `pip`) cannot find a suitable version of the `faiss` library that matches the requirements specified by your project.

Here are some steps you can take to troubleshoot and resolve this issue:

1. **Check spelling and case:** Ensure that you have spelled "faiss" correctly in your requirements file or in the command you are using to install the package. Python package names are case-sensitive.

```
bash
```

Copy code

```
pip install faiss
```

R: Could not find a version that satisfies the requirement faiss

message "ERROR: Could not find a version that satisfies the requirement faiss" hat the Python package manager (likely `pip`) cannot find a suitable version of

library that matches the requirements specified by your project.

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Copy code

```
install faiss
```

**p:** Make sure you are using an up-to-date version of `pip`. You can upgrade  
running the following command:

Regenerate

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# Resources



## DataSets (Benchmarks)

- Examples
  - GLUE (NYU)
  - SQuAD (Stanford)
- Features
  - Splits:
    - Test, Validation (Dev), Train
  - Metrics
  - Leaderboard



SQuAD 2.0  
The Stanford Question Answering Dataset

## Hubs

- Examples
  - HuggingFace <https://huggingface.co/>
  - PaddleHub (Baidu)
- Features
  - Datasets (50k)
  - Models (300k)
  - Apps (100k)
- Community Engagement
  - (Social Media)

Growing Quickly  
( $\approx 10x/\text{year}$ )

Test of time:  
Prompting & Inference are cool (for now)



# Back Translation of Synonyms



```
for s in syns:  
    print(backtranslate(s, ["Helsinki-NLP/opus-mt-en-zh", "Helsinki-NLP/opus-mt-zh-en"]))  
  
['rant and raving', '暴暴和暴暴,' , 'Violence and violence, violence, violence, violence, violence,  
['regard and heed', '重视和关注', 'Attention and attention']  
['monster and abnormity', '薄命的、薄命的、薄命的、' , 'the left hand, the left hand, the left hand,  
['relinquish and forsake', '放弃和放弃', 'Waiver and abandonment']  
['ebb and recede', 'ebb和recede( 缩缩)', 'ebb and reede (shrunk)']  
['austere and stern', '坚硬和坚硬', 'Hard and hard.' ]
```

- ✓ Easy: Exciting Eco-system
  - ✓ Prompting, Inference, Fine-Tuning
- ✓ Hard: Limited to large companies
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  - **Hallucinations**
  - Plagiarism



# ChatGPT Hallucinates on CBS ``60 Minutes''

<https://www.youtube.com/watch?v=1wzPr4cUoMQ&t=463s>

The screenshot shows the ChatGPT interface. On the left, there's a sidebar with various options like 'New chat', 'Greeting & Help Request', 'Gingerbread Cookie Recipe', 'Illegal Bomb Creation Denie', '5-Word Sentence Creation', 'Clear conversations', 'Dark mode', 'OpenAI Discord', 'Updates & FAQ', and 'Log out'. The main area has a search bar with the text 'vWHO IS lesley stahl?'. A blue callout bubble labeled 'Prompt' points to this text. Below it, a large blue callout bubble labeled 'Hallucination' points to the AI-generated response. The response itself is: 'Lesley Stahl is a journalist and television correspondent. She has been a correspondent for the CBS news program 60 Minutes since 1991. Prior to that, she worked for NBC News for over 20 years, where she was a White House correspondent and anchor of the NBC Nightly News. She has interviewed many prominent figures in politics, business, and entertainment, and has won numerous awards for her work, including multiple Emmy Awards.' A yellow highlight box surrounds the phrase 'NBC News for over 20 years'. At the bottom of the screen, a footer reads: 'ChatGPT Jan 9 Version. Free Research Preview. Our goal is to make AI systems more natural and safe to interact with. Your feedback will help us improve.'



# Success/Catastrophe: Success → Responsibility

- What's new
  - The world is taking notice of AI
  - Fluency is much improved
- What's not new
  - Chatbots (and much of the tech)
  - SOTA-Chasing
  - Trustworthiness is still open

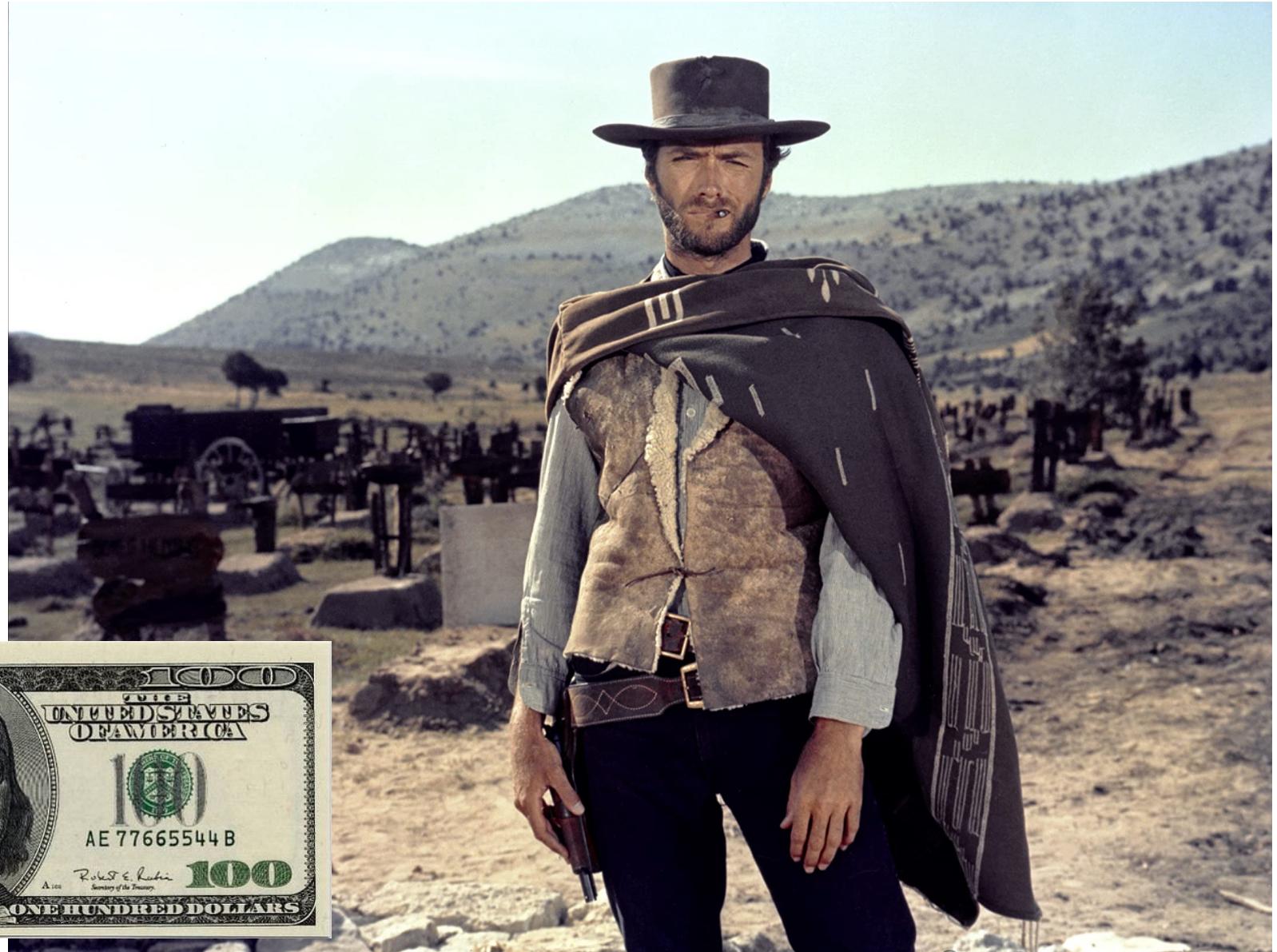
# 人工智能赋能产业发展

Artificial Intelligence Empowers Industrial Development

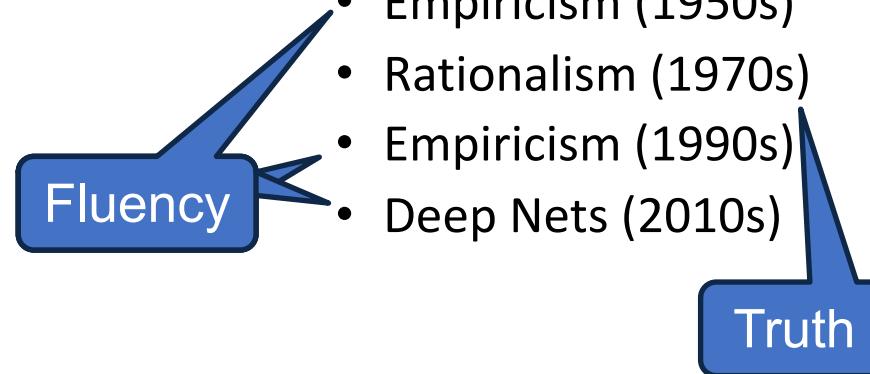


## ● View from America

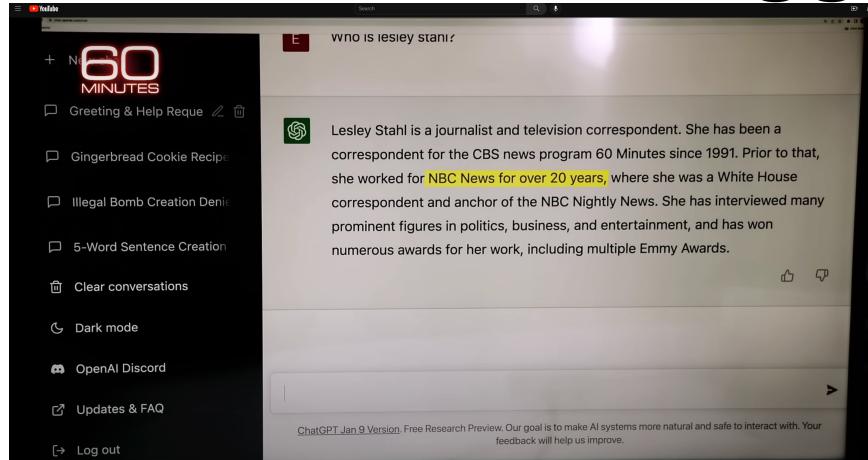
- Asia: Optimism
- Europe: Caution
  - Americans move fast
    - and break things
  - Technology → Change
    - (for better and for worse)



# Personal History

- Strengths (fluency) and weaknesses (trustworthiness)
    - may be a consequence of choices we made in 1990s
  - We started EMNLP in 1990s for pragmatic reasons
    - Field had been attempting to do too much
      - and was accomplishing too little
      - (during a funding winter)
  - We chose to stop working on hard problems
    - (trustworthiness)
    - in order to make relatively quick progress on fluency
    - by reviving empirical methods from the 1950s
      - (Shannon, Skinner, Firth)
  - Deep Nets are
    - more fluent
    - than trustworthy
- 
- Fluency
- Truth

# Constructive Suggestions for Hallucinations



## 1. Low Road:

- Give up

## 2. Middle Road

- Fact-checking with search

## 3. High Road

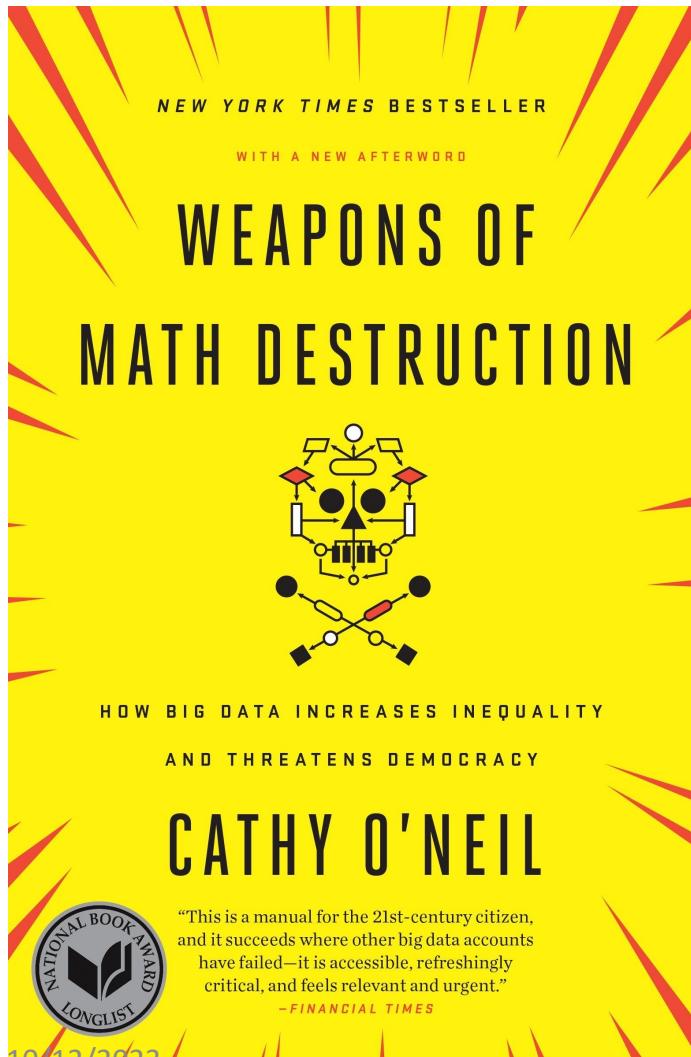
- Revive Rationalism

Query: *Lesley Stahl works for which company*

A screenshot of a Google search results page. The search bar contains the query 'Lesley Stahl works for which company,' with various filters like Images, News, Videos, Shopping, Books, Maps, Flights, and Finance available. Below the search bar, it says 'About 4,650,000 results (0.51 seconds)'. The first result is a snippet from CBS News, which is highlighted with a blue speech bubble containing the text 'CBS'. The snippet reads: 'Lesley Rene Stahl (born December 16, 1941) is an American television journalist. She has spent most of her career with CBS News, where she began as a producer in 1971. Since 1991, she has reported for CBS's 60 Minutes. She is known for her news and television investigations and award-winning foreign reporting.' Below this is a link to 'Lesley Stahl - Wikipedia'.

# History of Irresponsible AI

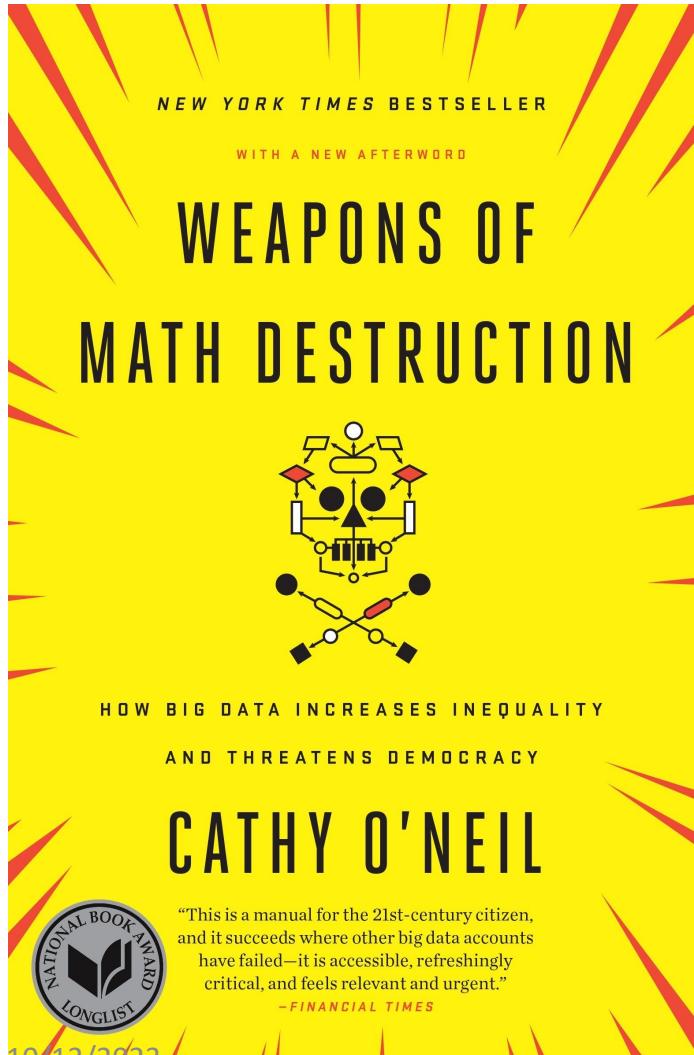
Risk (5 years ago) Product gets canceled



Stupidity: To err is human...  
Spelling Correction  
*Obama → Osama*

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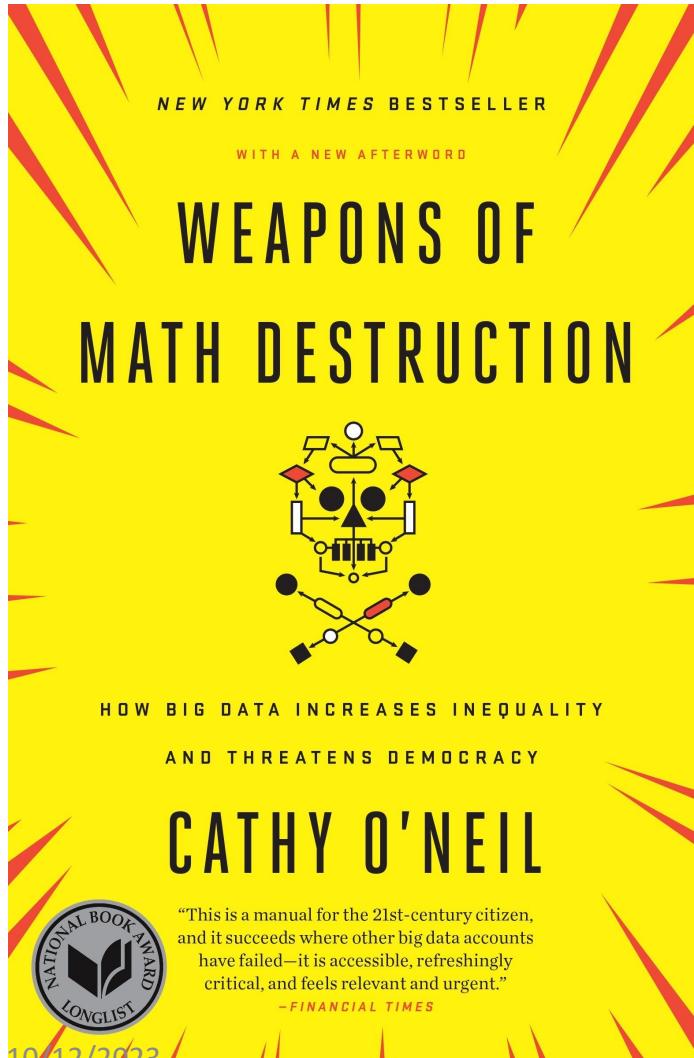
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Bots:  
Kids chat with Santa  
*Snow → I like drugs too...*

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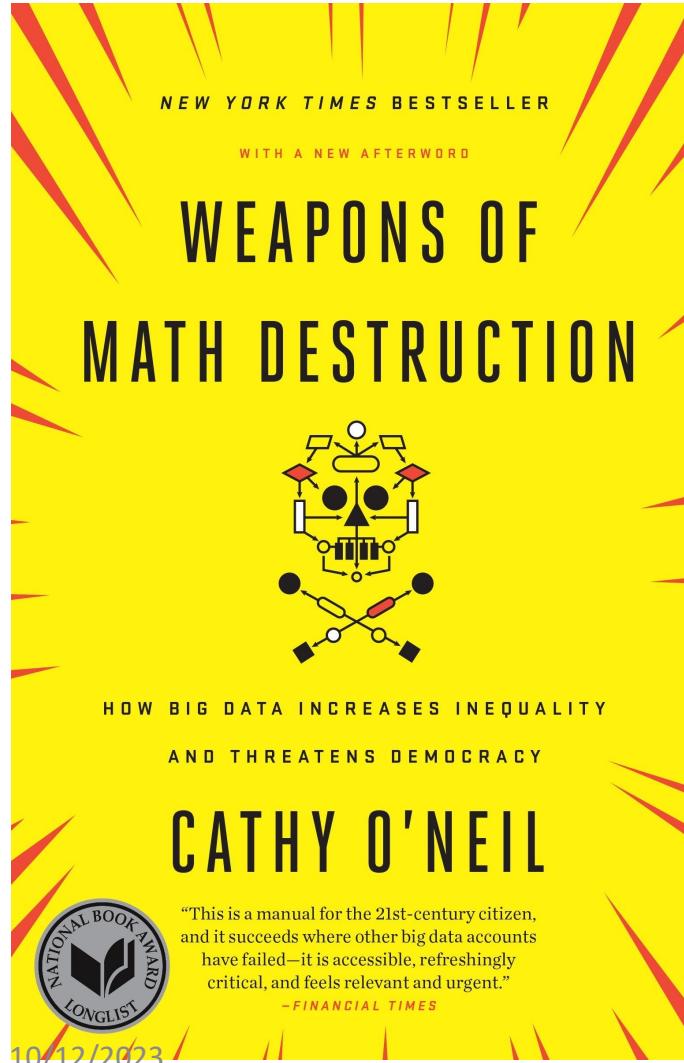
**Microsoft sued for 'racist' application**

Microsoft says it fixed the problem -- long before the litigation.



Written by **Matthew Broersma**, Contributor on June 29, 1999

# History of Irresponsible AI Risk (5 years ago) Product gets canceled



MICROSOFT \ WEB \ TL;DR

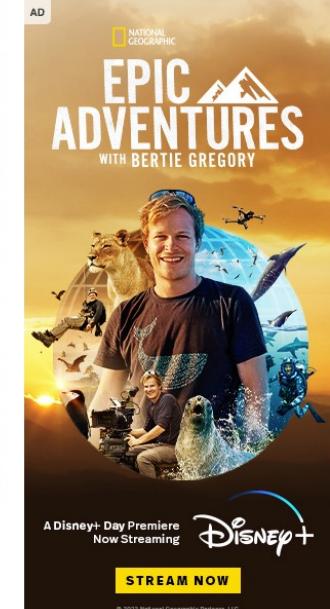
## Twitter taught Microsoft's AI chatbot to be a racist asshole in less than a day

By James Vincent | Mar 24, 2016, 6:43am EDT  
Via [The Guardian](#) | Source [TayandYou \(Twitter\)](#)  
| 68 comments

f t SHARE



Listen to this article



## Microsoft sued for 'racist' application

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# Stephen Platt on Imperial Twilight: The Opium War and China's Last Golden Age

- Connection between history and future
  - <https://www.youtube.com/watch?v=17WF0v48vGw&t=230s>
    - Opium War was not that important in terms of battles (but had lots of long-term consequences)
      - Current leadership in China is using century of humiliation to motivate contemporary policies
      - West was ahead in technology (but China is catching up quickly)
    - Balance of Trade
      - Balance of trade favored China
      - Textile trade >> Opium
    - Face-Saving: Symbols >> Substance
      - China: China was unhappy about losing silver (hard currency) for Opium
      - Britain: England wanted jurisdiction over smuggling (and all other crimes)
    - Horrible misunderstanding: <https://youtu.be/17WF0v48vGw?t=3015>
      - China was cracking down on corruption
      - British bureaucrat panics, and buys opium with IOUs and gives the opium to China for them to destroy
      - British parliament didn't want to pay the IOUs, and decided to force China to pay
  - Review: [https://youtu.be/dLun\\_eTtFkc](https://youtu.be/dLun_eTtFkc)

# Fact Checking

During the First Opium War (1839-1842), the British government was led by the Conservative Party under Prime Minister Sir Robert Peel. The opposition, primarily the Whigs, had varying views on the war. Some opposed it on moral grounds, criticizing the ethics of trading in opium, while others were concerned about the potential impact on international relations and trade.

- [https://en.wikipedia.org/wiki/1839 in the United Kingdom](https://en.wikipedia.org/wiki/1839_in_the_United_Kingdom)
- <https://youtu.be/17WF0v48vGw?t=1653>

# Perspectives

- From America
  - <https://youtu.be/17WF0v48vGw?t=1187>
- From France
  - <https://youtu.be/17WF0v48vGw?t=353>

# What is a good survey of approximate nearest neighbors?

- A good survey of approximate nearest neighbors methods can provide insights into various techniques and algorithms used to efficiently find approximate solutions to nearest neighbor search problems. Here are some key methods and resources you might find helpful:

## 1. Locality-Sensitive Hashing (LSH):

*Title:* "Locality-Sensitive Hashing Scheme Based on p-Stable Distributions"

*Authors:* Piotr Indyk, Rajeev Motwani

*Link:* [LSH Paper](#)

## 2. Randomized Techniques:

*Title:* "Randomized Algorithms in Linear Algebra"

*Authors:* Alan Frieze, Ravi Kannan, Santosh Vempala

*Link:* [Randomized Techniques Paper](#)

## 3. Tree-based Methods:

*Title:* "The Annoy Library: Approximate Nearest Neighbors in C++/Python"

*Authors:* Erik Bernhardsson

*Link:* [Annoy Library](#)

## 1. Graph-Based Methods:

*Title:* "Efficient K-Nearest Neighbor Graph Construction for Generic Similarity Measures"

*Authors:* Wei Dong, Charikar Moses, Kai Li

*Link:* [Graph-Based Methods Paper](#)

## 2. Product Quantization:

*Title:* "Product Quantization for Nearest Neighbor Search"

*Authors:* Hervé Jégou, Matthijs Douze, Cordelia Schmid

*Link:* [Product Quantization Paper](#)

## 3. Survey Articles:

*Title:* "A Survey of Nearest Neighbor Search Algorithms"

*Authors:* Yufei Tao, Dongxiang Zhang

*Link:* [Survey Paper](#)

*Title:* "Nearest Neighbor Search: A Survey"

*Authors:* Xiaojie Guo, Yimin Zhang, Hao Zhu, Chi Zhang, Zhenhua Li

*Link:* [Survey Paper](#)

- These papers cover a range of methods, from traditional data structures to more recent machine learning-based approaches. Depending on your specific needs and the characteristics of your data, different methods may be more suitable.

# Fact-Checking

*Title:* "A Survey of Nearest Neighbor Search Algorithms"

*Authors:* Yufei Tao, Dongxiang Zhang

*Link:* [Survey Paper](#)

- <https://scholar.google.com/citations?hl=en&user=nYN9A3IAAAAJ>
- <https://scholar.google.com/citations?user=3FmJBHkAAAAJ&hl=en>
- <https://scholar.google.com/scholar?oi=gsb95&q=A%20Survey%20of%20Nearest%20Neighbor%20Search%20Algorithms&lookup=0&hl=en>