

# PROBLEMS OF TECHNOLOGY FOR SOCIETY

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# COMPUTING TECH. HOLDS MANY PROMISES:

- Scientific breakthroughs
- Business value
- Educational value
- Better decisions & coordination
- ...

## BUT IT CAN ALSO CAUSE PROBLEMS:

- Privacy & security issues
- Fairness & discrimination issues
- ...

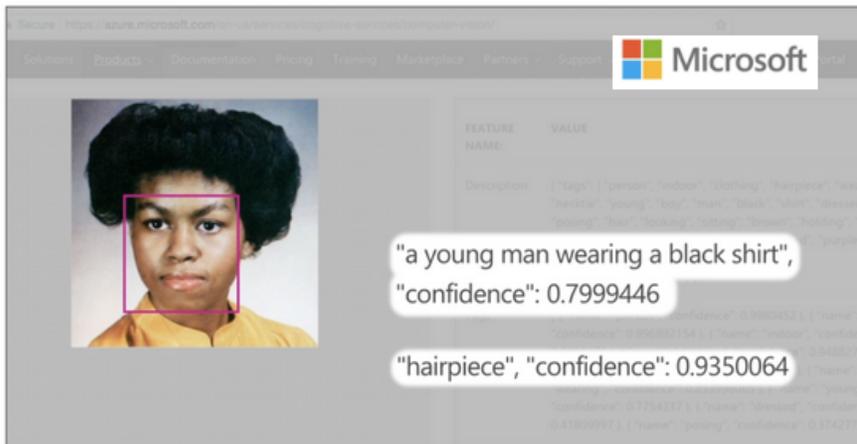
# CLASS EXCHANGE

- Think of a problems caused by tech for *yourself* or *your family/friends* (1')
- Explain it to your neighbor (2x2')
- Lastly: let's exchange the ideas in class

# TECHNOLOGY & FAIRNESS

# CAN ALGORITHMS BE PREJUDICED?

*If yes, why and when does it happen?*



Joy Buolamwini, Algorithmic Justice League



(Caliskan, 2016)

# PRICE DISCRIMINATION (INTENT.)

## What's the Deal?

Online travel brokers offer different prices depending on the customer's operating system, browser history and device.

### Prices for overnight lodging



CheapTickets  
ORBITZ

+



not  
logged  
on

= +\$12

Not being logged in to these sites causes some users to be charged more.



travelocity

+



iOS

= -\$15

Using iOS saves Travelocity customers money.



Hotels.com  
The Obvious Choice™  
Expedia

+



= +10%

These sites show higher-priced hotels to some users at random.

Source: Northeastern University College of Computer and Information Science, Personalization Research Group

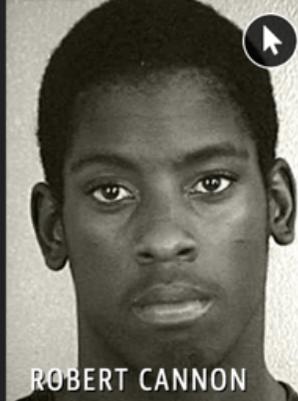
The Wall Street Journal

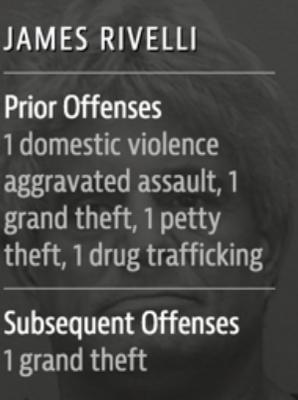
# INFAMOUS: "CORRECTIONAL OFFENDER MANAGEMENT PROFILING FOR ALT. SANCTIONS"

To learn more: <http://modelai.gettysburg.edu/2023/compas/> (reported 2016)

 <p><b>VERNON PRATER</b></p> <p><b>Prior Offenses</b> 2 armed robberies, 1 attempted armed robbery</p> <p><b>Subsequent Offenses</b> 1 grand theft</p> <p><b>LOW RISK</b> <b>3</b></p>	 <p><b>BRISHA BORDEN</b></p> <p><b>Prior Offenses</b> 4 juvenile misdemeanors</p> <p><b>Subsequent Offenses</b> None</p> <p><b>HIGH RISK</b> <b>8</b></p>
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 <p><b>DYLAN FUGETT</b></p> <p><b>LOW RISK</b> <b>3</b></p>	 <p><b>BERNARD PARKER</b></p> <p><b>HIGH RISK</b> <b>10</b></p>
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 <p><b>JAMES RIVELLI</b></p> <p><b>LOW RISK</b> <b>3</b></p>	 <p><b>ROBERT CANNON</b></p> <p><b>MEDIUM RISK</b> <b>6</b></p>
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 <p><b>JAMES RIVELLI</b></p> <p><b>Prior Offenses</b> 1 domestic violence aggravated assault, 1 grand theft, 1 petty theft, 1 drug trafficking</p> <p><b>Subsequent Offenses</b> 1 grand theft</p> <p><b>LOW RISK</b> <b>3</b></p>	 <p><b>ROBERT CANNON</b></p> <p><b>Prior Offense</b> 1 petty theft</p> <p><b>Subsequent Offenses</b> None</p> <p><b>MEDIUM RISK</b> <b>6</b></p>
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# INFAMOUS: “SYSTEM RISK INDICATOR”

*In 2020, The Hague Court ruled that SyRI violated the European Convention on Human Rights*

## Dutch government resigns over **Child Benefits Scandal**

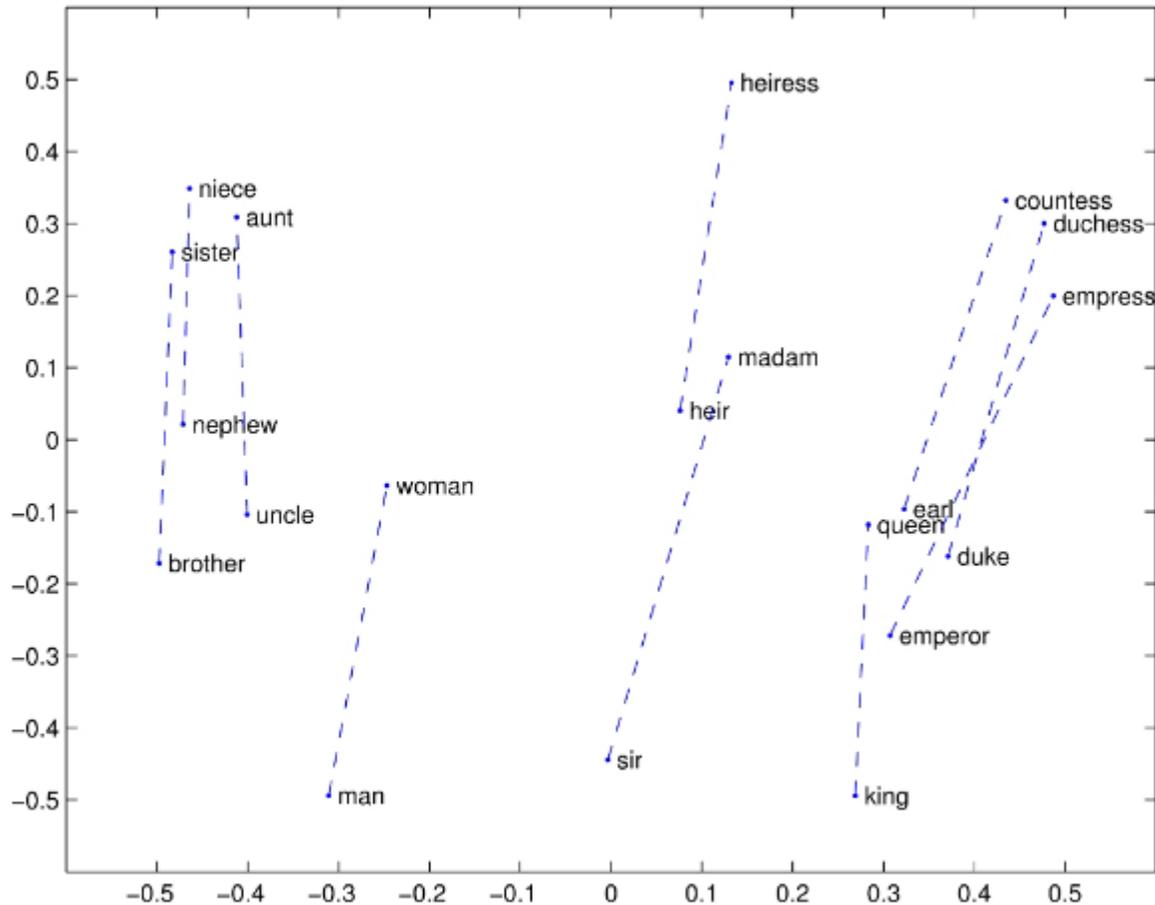


# ML NEEDS BIAS TO GENERALIZE

(Terminology Clarification!)

*“Although removing all biases from a generalization system may seem desirable, the result is nearly useless: an unbiased learning system’s ability to classify new instances is no better than if it simply stored all the training instances and performed a lookup” (Mitchell, 1980)*

# WORD EMBEDDINGS CAPTURE INTERESTING RELATIONS



**Figure 3.** A 2D projection (first two principal components) of the 300-dimensional vector space of the GloVe word embedding (Pennington et al., 2014). The lines illustrate algebraic relationships between related words: pairs of words that differ only by gender map to pairs of vectors whose vector difference is roughly constant.

# ...BUT ALSO UNFORTUNATE INEQUALITIES

By [Caliskan et al. \(2017\)](#); Explains the doctor/nurse he/she translation bias

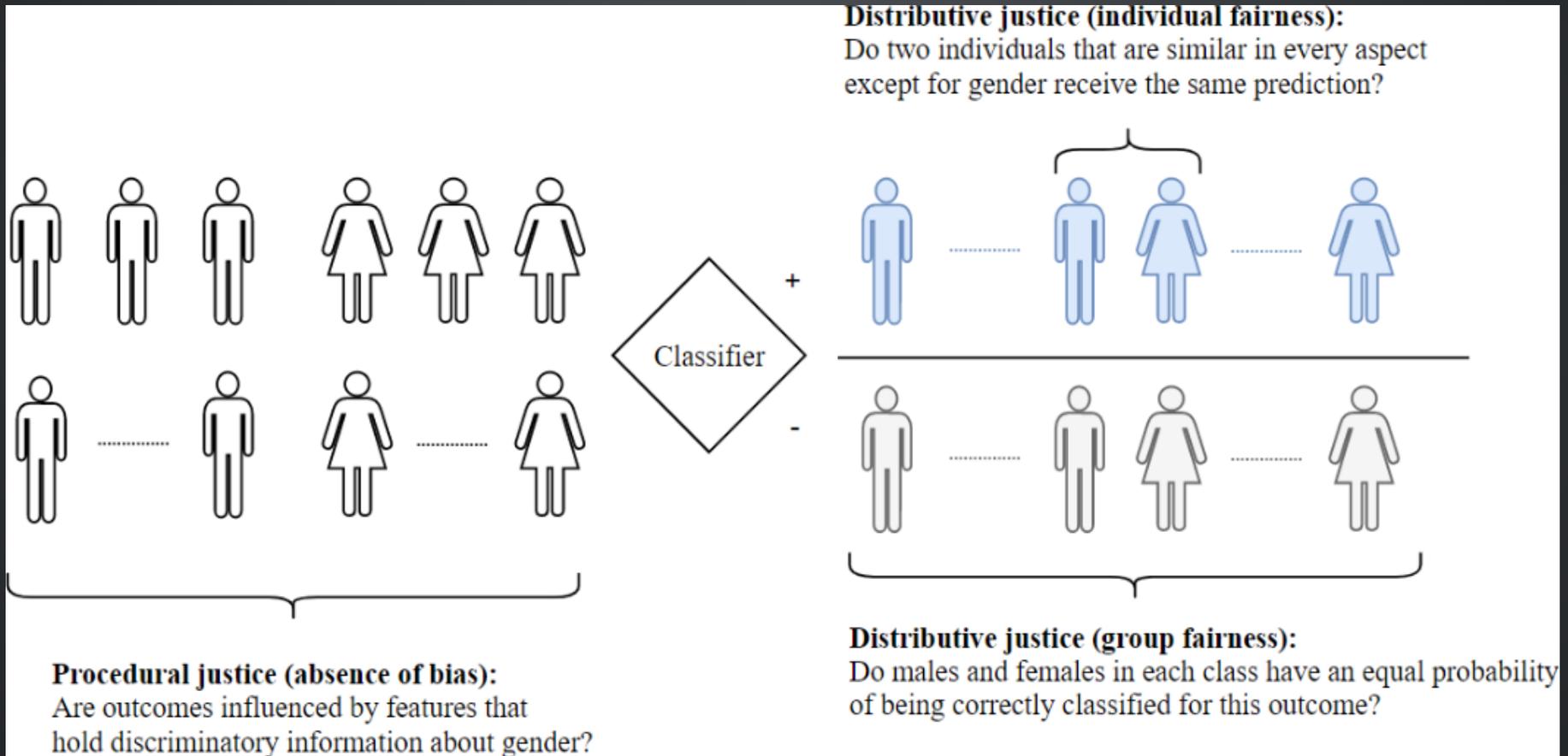


# TECHNICAL MEASURES FOR ROBUST & FAIR AI:

- Accurate & representative data  
→ *docu. helps* (“*datasheets for datasets*”)
- Awareness of existing social inequalities  
→ *diverse team helps*
- Possibly: fair ML, causal ML, eXplainable AI...

# FAIRNESS HAS VARIOUS DEFINITIONS & METRICS

So some deliberation (and political discussion) is necessary. Figure source: [\(Khalehgi, 2020\)](#)



# UNFORTUNATELY STILL COMMON (2023)

Microsoft Bing professional hair women

TUDO **IMAGENS** VIDEOS MAPAS NOTÍCIAS MAIS

Hairdresser Hair Stylist Hair Care Extreme Long Hair Image Hairstyle Lo Ha

31 Professional Hairstyles That Are Perfect For Work - L'Oréa...

736 x 980 - jpeg  
Pinterest

Cool 43 Beautiful Professional Hairstyles For Women... More...

Top 10 Hairstyles for Professional Women - Style O...

Hairstyles for Executive Professional Women | Hair | P...

20 Top Professional Hairstyles for Women to Try

15 Professional Hairstyles for Women To Look Classy - Hair...

20 Best Professional Hairstyles for Women to Try

Pesquisas relacionadas

90s Hair

Great Hair

Top Hairstyles For Professional Women

Microsoft Bing unprofessional hair women

TUDO **IMAGENS** VIDEOS MAPAS NOTÍCIAS MAIS

Beauty Hair Hairstyle Beautiful Female Hair Beautiful Girl Hair Cute Haircut

29+ unprofessional hair for women - LarisahLeif

10+ Unprofessional Hairstyles For Women | FASHIONBLOG

20+ Amazing Unprofessional Hairstyles Women of 2023

20+ Amazing Unprofessional Hairstyles

20+ Amazing Unprofessional Hairstyles

25 Types of unprofessional hairstyles - Human Hair ...

Google search for unprofessional hairstyles at work features ALL black ...

Unprofessional Hairstyles Wo...

20+ Amazing Unprofessional Hairstyl...

unprofessional hairstyles men

29+ unprofessional h...

unprofessional hairstyles men

Rosalia @BonKaMonia  
saw a tweet saying "Google unprofessional hairstyles for work". did. Then I checked the 'professional' ones 🤔🤔🤔

Google search for 'unprofessional hairstyles at work' features ALL ...

# DISCRIMINATION IS ILLEGAL: STUDENTS FIGHT BACK

*Dutch Inst. of Human Rights: Use of anti-cheating software can be algorithmic discrimination, i.e. racist ([RacismAndTech, 2022](#))*



# EQUALITY ALSO MEANS ACCESS



European  
Commission

EN English

Search

Shaping Europe's digital future

## Web Accessibility

What is web accessibility? Web accessibility allows everyone, including people with disabilities, to perceive, understand, navigate and interact with the Internet.

[Summary of the Web Accessibility Directive >](#)

[European disability strategy 2021-2030 >](#)

[Member State bodies in charge of WAD monitoring, reporting and enforcement >](#)



*Websites & apps must be “perceivable, operable, understandable, & robust” (for everyone)*

# LET'S NOT FORGET THE “HIDDEN” LABOR BEHIND AI

E.g., read [TIME \(2023\)](#) “The \$2 Per Hour Workers Who Made ChatGPT Safer”



Credit: <http://speculative.capital/>

 *Short Break* 

# OTHER ASPECTS

# SOCIAL MEDIA & MENTAL HEALTH

As SM became popular, mental health of young people worsened... Is there a causal link?

12 Dec 1998 - 13 Feb 2023 2004 **2005** 2006 ▾ About this capture

login register about help

**Welcome to the Facebook!**

**The Facebook is an online directory that connects people through social networks at schools.**

Now there are two Facebooks: one for people in **college** and one for people in **high school**.

The site is open to [a lot of schools](#), but not everywhere yet. We're working on it.

You can use Facebook to:

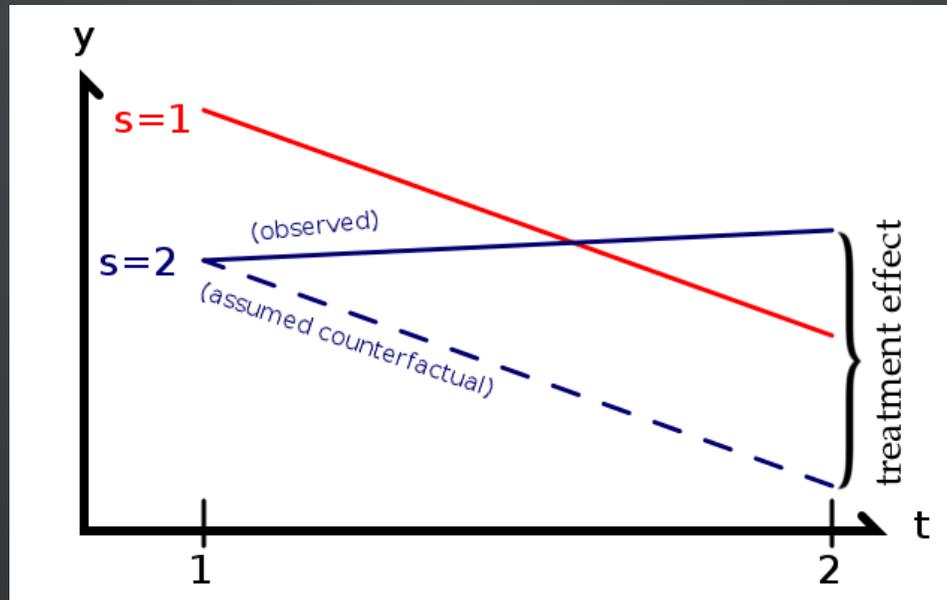
- Look up people at your school.
- See how people know each other.
- Find people in your classes and groups.

[Login](#) [Register](#)

[about](#) [jobs](#) [announce](#) [advertise](#) [terms](#) [privacy](#)  
a Mark Zuckerberg production  
Facebook © 2005

# A NATURAL EXPERIMENT

- Braghieri, et al. (2022) use *staggered* intro. of FB across 775 US colleges as *natural experiment*
- Connect this with NCHA health survey data
- Generalized *difference-in-differences* method

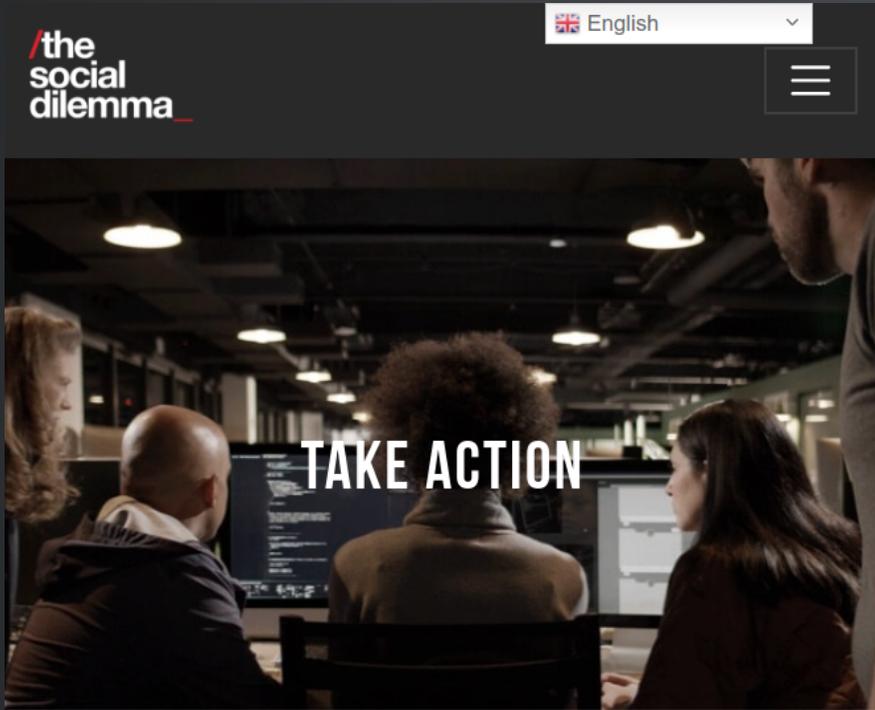


# DID RESULTS

	Index of poor mental health		
	(1)	(2)	(3)
Post-Facebook introduction	0.137 (0.040)	0.124 (0.022)	0.085 (0.033)
Observations	374,805	359,827	359,827
Survey-wave fixed effects	✓	✓	✓
Facebook-expansion-group fixed effects	✓	✓	
Controls		✓	✓
College fixed effects			✓
FB-expansion-group linear time trends			

- Intro of FB increased depression by ~9%
- Mechanism: unfavorable social comparisons

# WHAT'S THE REMEDY FOR SM (PLATFORM) PROBLEMS?



**the social dilemma**

English

**TAKE ACTION**

**Help change how technology is designed, regulated and used**



European Commission

English Search

Shaping Europe's digital future

Menu

[Home](#) > [Policies](#) > [The Digital Services Act package](#)

## The Digital Services Act package

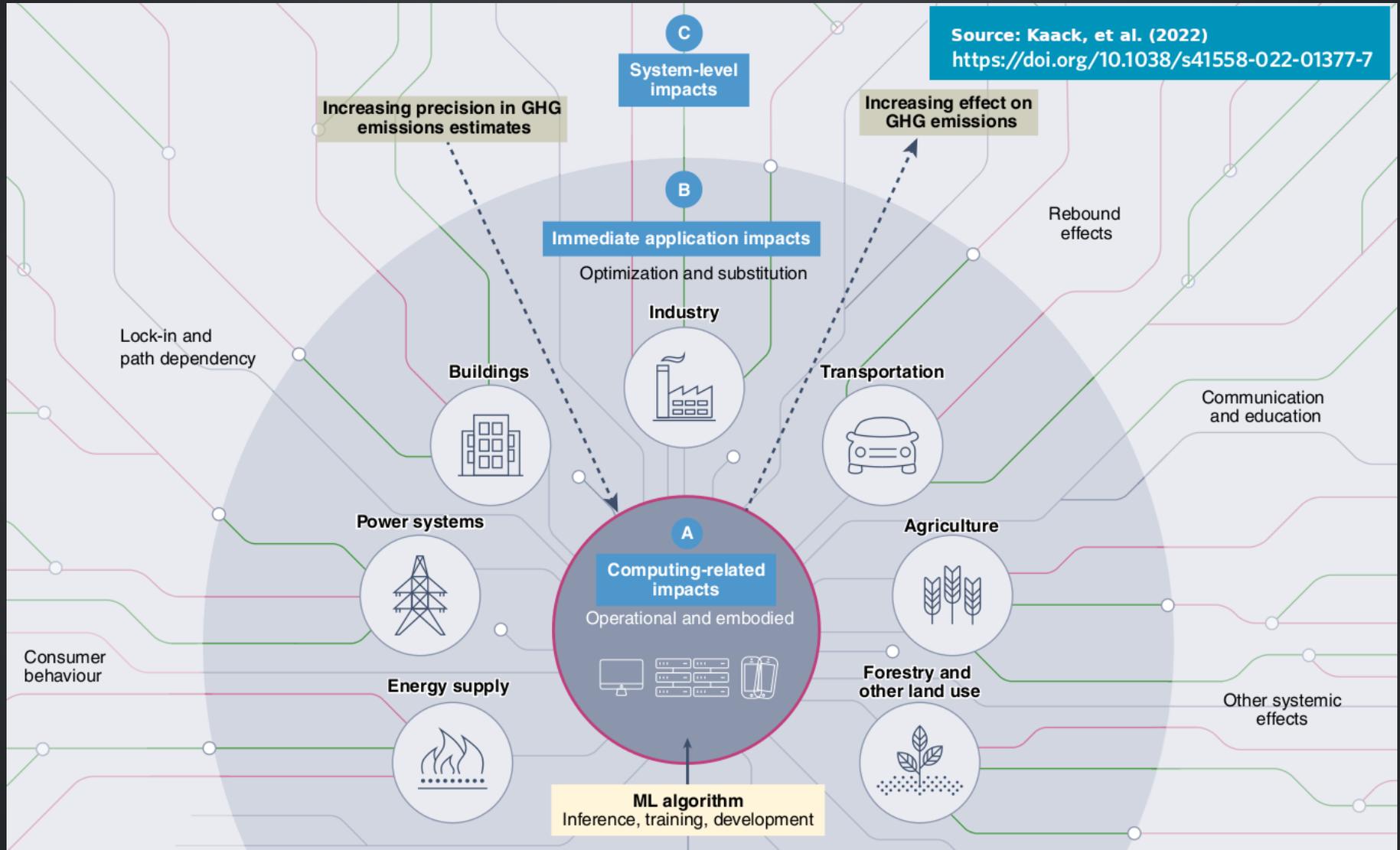
The Digital Services Act and Digital Markets Act aim to create a safer digital space where the fundamental rights of users are protected and to establish a level playing field for businesses.

# COMPUTING & CLIMATE CHANGE

How does the growth of AI affect GHG emissions?



# FRAMEWORK FOR ASSESSING GHG EMISSIONS IMPACTS (KAACK ET AL.)



# TAKEAWAYS REGARDING EMISSIONS

- ICT is responsible for 1.4% of global GHG emissions; room for optimization
- The downstream effects are much larger and more difficult to assess—both *positive* and *negative*

# HOW TO ENSURE TECH SERVES THE ‘PUBLIC INTEREST’?

AI & SOCIETY

## AI for the public. How public interest theory shifts the discourse on AI

Theresa Züger<sup>1</sup> · Hadi Asghari<sup>1</sup>

Received: 6 May 2021 / Accepted: 13 April 2022

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[doi:10.1007/s00146-022-01480-5](https://doi.org/10.1007/s00146-022-01480-5)

# THE 'PUBLIC INTEREST' IN PHIL. & LAW:

- Public is counter to 'private' interests
- Several methods to determine PI: deliberation key
- Courts consider equality an important factor

# ACTION POINTS FOR PI/AI

1. Justify use of tech!
2. Must serve (not heed) equality
3. Use participatory/deliberative design
4. Implement technical safeguards
5. Be open to validation

# FINAL CLASS EXERCISE

1. We'll pick a societal problem of tech
2. Individually: reflect on how to assess this problem from what you learned today (1')
3. With a neighbor: discuss your ideas (2' each)
4. Together: class discussion

# CONCLUSIONS

- Technology causes a variety of societal problems
- Critical to monitor & assess extent of such problems
- Follow latest research and laws in your area

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