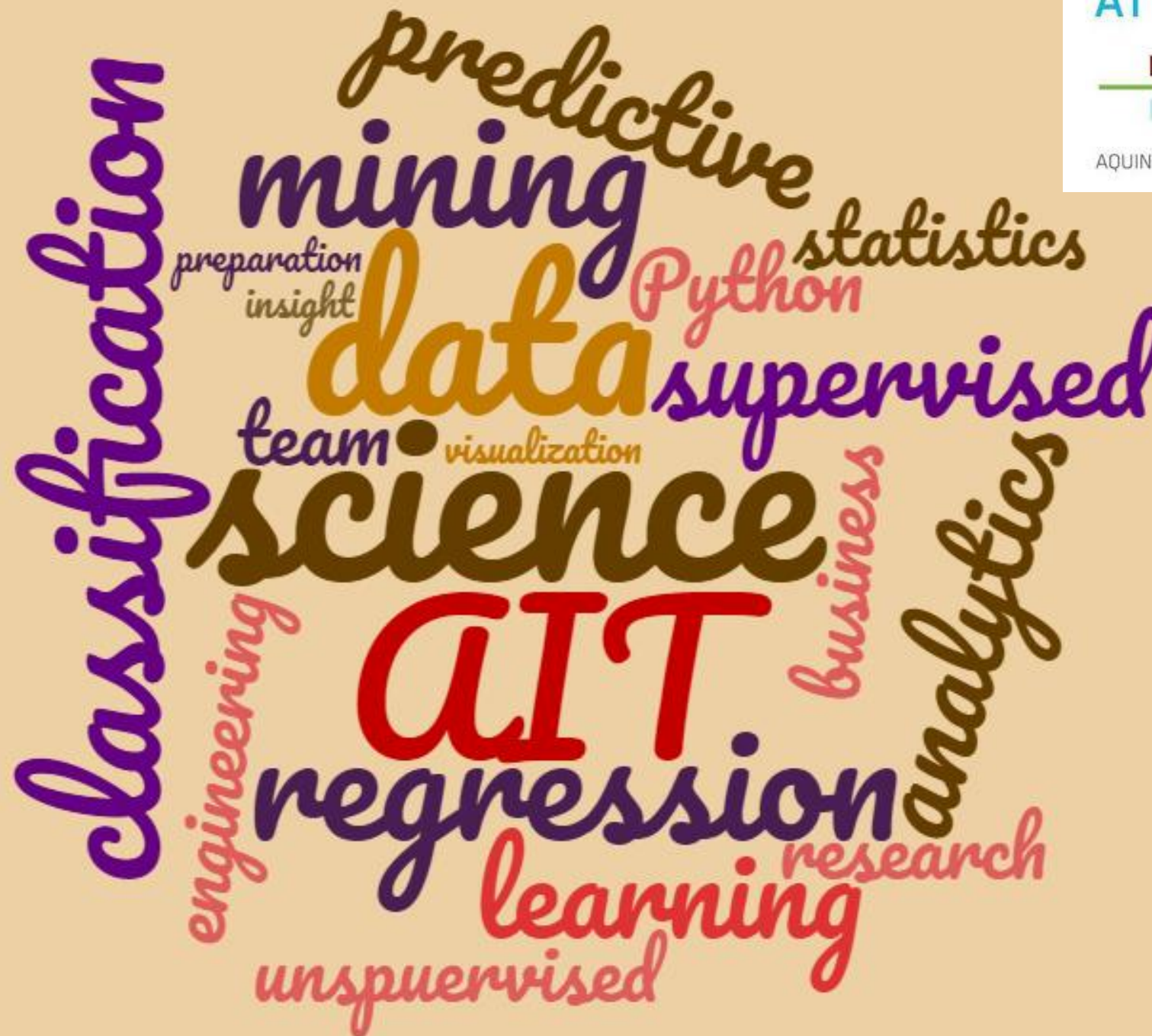


Data Science

March 24, 2020.
Ethical and moral
dilemmas



AIT-BUDAPEST



AQUINCUM INSTITUTE OF TECHNOLOGY

Roland Molontay

New schedule of the semester

	<i>Tuesday class</i>	<i>Thursday</i>	<i>Friday class</i>	<i>Sunday</i>
W1 (02/03)				
W2 (02/10)			HW1 out	
W3 (02/17)				
W4 (02/24)		HW1 deadline	HW2 out	Forming teams
W5 (03/02)				
W6 (03/09)			CANCELLED	
BREAK	BREAK	HW2 deadline	BREAK	
W7 (13/23)	HW3 out		MIDTERM / Project plan	
W8 (03/30)				HW3 deadline
W9 (04/06)			GOOD FRIDAY	
W10 (04/13)	HW4 out	MILESTONE 1		
W11 (04/20)				HW4 deadline
W12 (04/27)			LABOR DAY	
W13 (05/04)		MILESTONE 2		
W14 (05/11)	FINAL		PROJECT presentations	

Requirements

- ~~Attendance: there will be sign-up sheets every time~~
- MIDTERM (25%)
 - On Week 7
 - You can use your own „cheat sheets”/ formula sheets / notes
- FINAL (25%)
 - On Week ~~13~~-14
 - You can use your own „cheat sheets”/ formula sheets /notes
- HOMEWORK problems (25%)
 - There will be 4 HW sheets (in every two weeks)
 - Mostly programming problems
- PROJECTS in teams (25%)
 - In teams of 3 (2-4) students



Requirements



Projects

- A data science project in teams
 - Team: 3 (2-4) students
 - All the team members will get the same grade point
 - It is recommended to use a version control tool to share your codes with each other, e.g. <https://github.com/>
 - **A teaching assistant will be assigned for each team to help you/ provide guidance.**
- Choose a problem that all the team members are interested in
- Schedule
 - W4: forming teams
 - W7: project plan is ready
 - W10: milestone 1
 - W13: milestone 2
 - W14: ~~classroom~~ Zoom presentation

Expectations

- Delivering a sophisticated enough data science project
- Studying related work (related papers, projects)
 - Understand what others have done, attempt to not only reproduce the results but improve them in some aspects
- Implementing techniques that we have covered in class
- Try more models, evaluate them, find the best models
- Nice and shiny data visualization
- Optional but appreciated: using models/techniques that we have not covered in class

Deliverables

- W4: Team name + list of team members
- W7: **Project plan**
 - One page long report answering the following questions:
 - What is the vision? Why is the problem interesting?
 - What is the purpose of the project? What results do you expect?
 - What data do you plan to use? How do you plan to gather the data?
 - Are the data big enough and of suitable quality?
 - What data preparation steps do you plan to take?
 - What methodology, what models do you plan to use?
 - How would you visualize the results?

Deliverables II.

- **W10: Milestone 1**

- Two-page-long report covering the followings:
 - Have you managed to gather the data? Do you have enough data of appropriate quality?
 - Did you collect the relevant related works? What useful information could you discover?
 - Initial data analysis steps
 - What next steps do you plan to take?

- **W13: Milestone 2**

- Three-page-long report covering the followings:
 - Reviewing the related works
 - Data understanding and data preparation steps
 - More data analysis steps, implementing some models and evaluating them

Final deliverable: classroom presentation

- W14: oral presentation in **ZOOM** should include
 - ~ 8 minutes / person
 - Description of the problem, motivation
 - Some review of related works
 - Description of the data set
 - Data preparation steps
 - Modeling steps (what models, parameters of the models)
 - Evaluation of the models
 - Sophisticated visualization
 - Interpreting the results, conclusion



Final deliverable II.: codes

- W14: well-written codes (preferably an Ipython notebook)
 - Comments are necessary



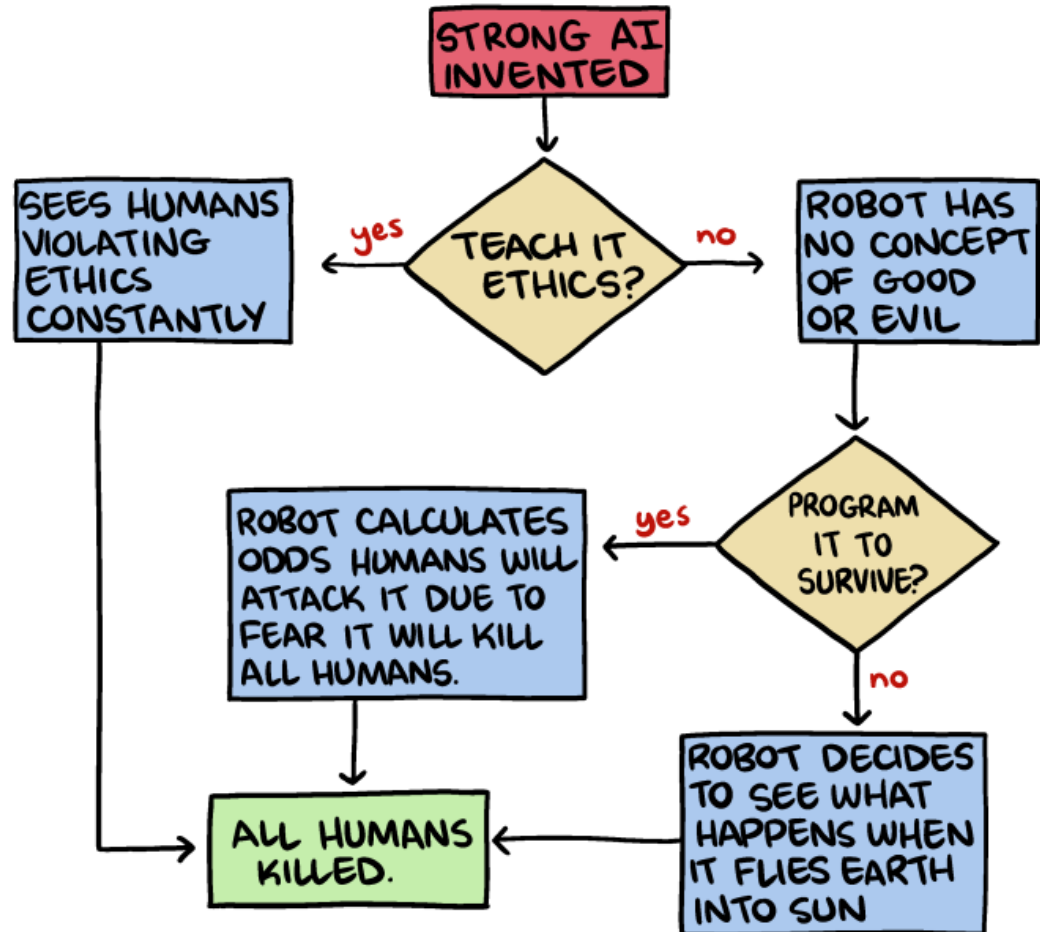
Ethical and moral dilemmas in data science

- There are several moral, ethical (and even legal) questions raised in almost all phases of the data science workflow (collecting the data, storing, analyzing, deploying)
 - These questions are location and time dependent
 - E.g. in the EU the regulation is stricter than in the USA
- Especially sensitive data: medical data, personal data

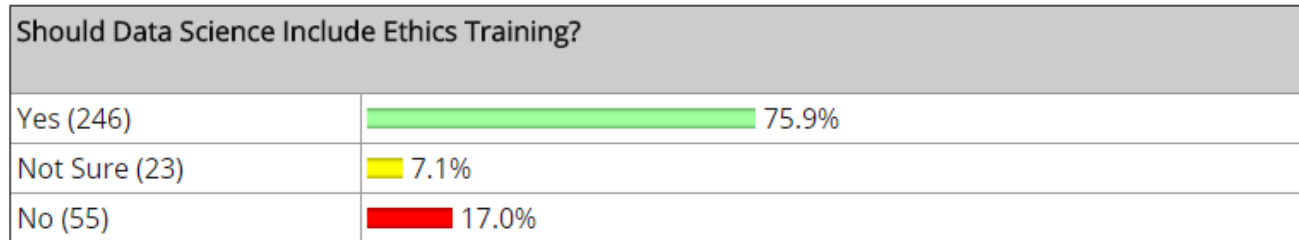


Ethics for artificial intelligence

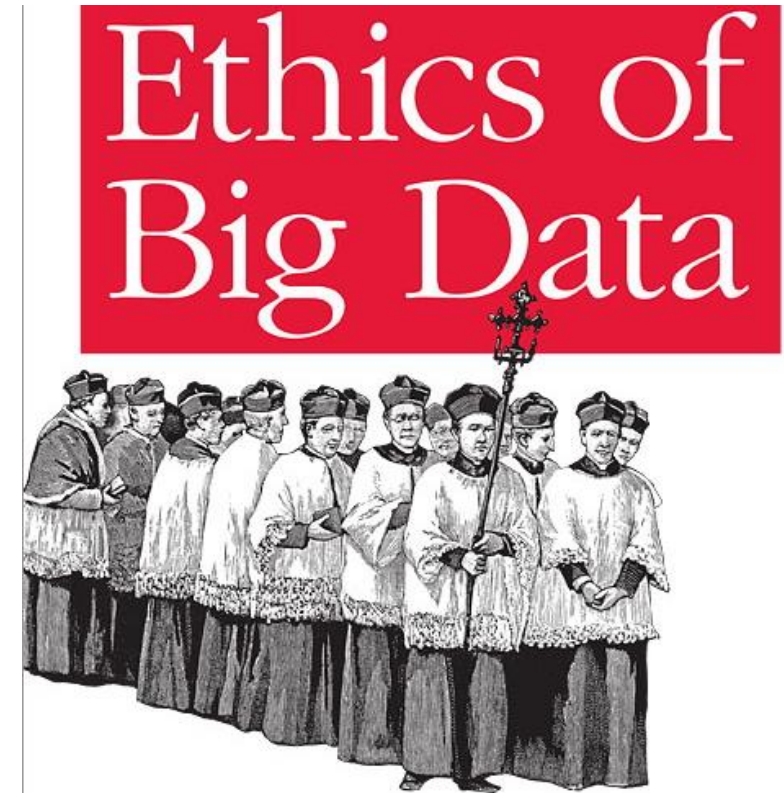
- Other name: Roboethics
 - Several sci-fi, book, movie elaborate on this topic
 - A separate discipline
 - This is not what we are considering here



Should a data scientist care about ethical issues?



There are even university courses such as „Ethics in Data Science”



Target and pregnancy

- Target sends coupons to its customers based on their purchase history
- Target predicted that a teenager is pregnant and sent the related coupons to her address
- Her father opened up the envelope...
- He was not happy... Well it is not the best to discover it that way



Dating sites and their profit

- The aim of a dating site is to make the subscription period as long as possible
 - This is conflicting with finding the best partner as soon as possible
 - Is it acceptable to facilitate that goal with data science techniques?



Can we rely on the predictions?

- What decisions should be based on the predictions?



Personalized advertising

- How can our personal data be used?
- Sometimes the targeting goes totally wrong



How to use the results?

- Educational data mining:
Is it acceptable to tell the students that the algorithm predicted that (s)he will drop out?
- Can you mention some good/bad methods for the utilization of the results?



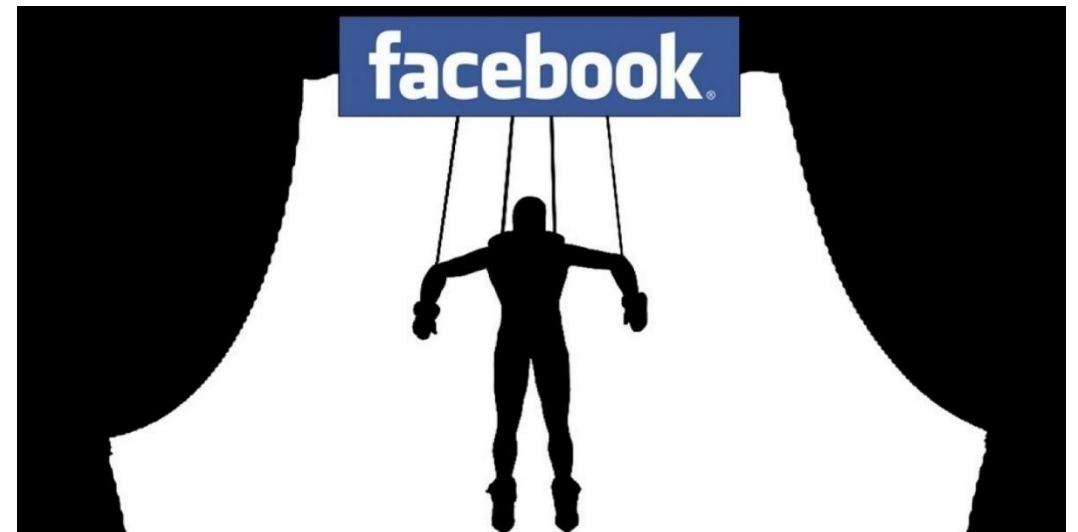
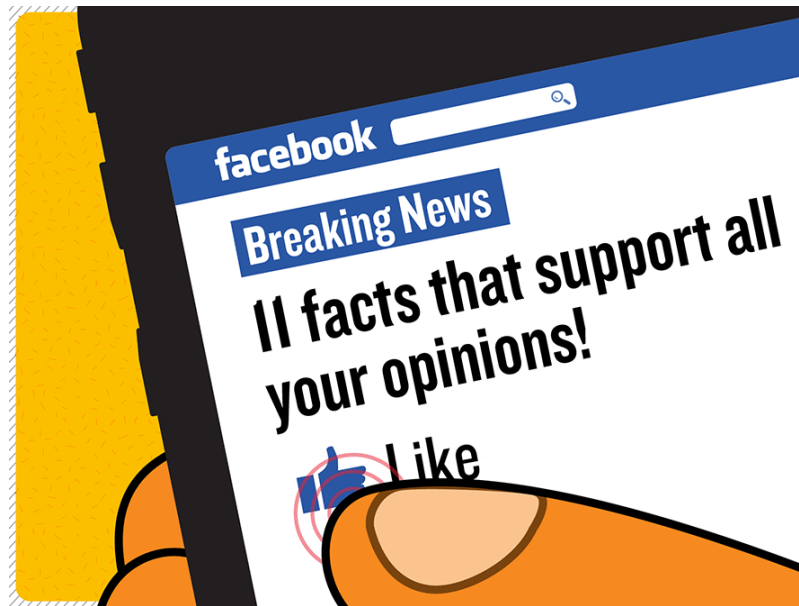
What do you think?

- Prices that depend on the used operational system or search history?



Power of Facebook and Google

- Experiment of Facebook: recommending positive/negative contents
 - Also elections can be influenced that way
- News selection, filter bubble, „echo chamber” → social polarization





Face recognition security system

Public safety vs. Privacy



Chinese businesswoman accused of jaywalking after AI camera spots her face on an advert



The image of Ms Dong on a public display screen

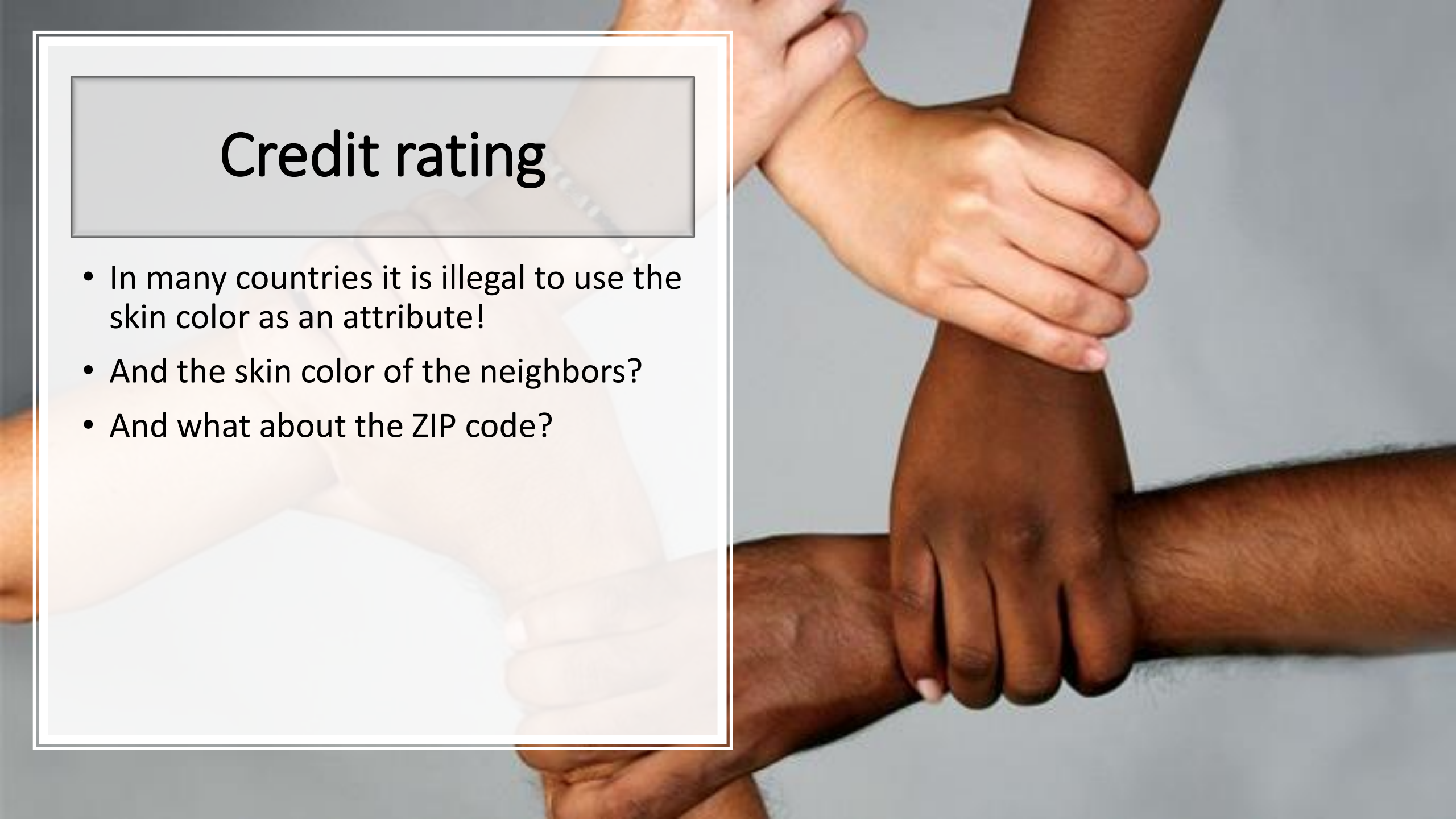
What kind of data should be used?

- Is it acceptable to use the race for the prediction? Is it acceptable to record it?
 - Does it depend on the application domain?



Credit rating

- In many countries it is illegal to use the skin color as an attribute!
- And the skin color of the neighbors?
- And what about the ZIP code?



Recommending extremist contents

- Is it acceptable that the recommender system recommends extremist content for people who are acceptant for extreme views?



Deepfake videos 'double in nine months'



Cellan-Jones
TV correspondent

California cracks down on political and pornographic deepfakes

Residents can now sue anyone who puts their image in porn...

EDITOR'S PICK | 707 views | Oct 8, 2019, 08:35am

Forget Fake News, Deepfake Videos Are Really All About Non-Consensual Porn



Davey Winder Senior Contributor @
Cybersecurity

I report and analyse breaking cybersecurity and privacy stories

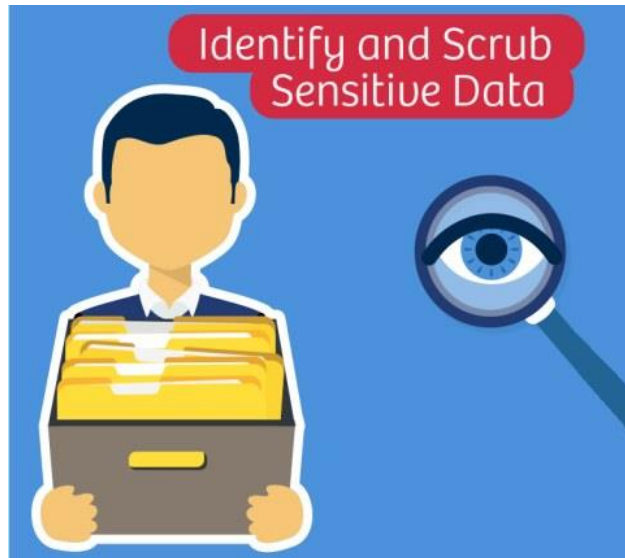
The number of deepfake videos online is spiking. Most are porn



By [Rachel Metz](#), [CNN Business](#)

Updated 1538 GMT (2338 HKT) October 7, 2019

Some advice!



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