

how digital tools can impact gender equality ?



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**Our digital tools are not
neutral. They influence our
gender perception.**





1

introduction



Example of digital tools



Example of digital tools



NETFLIX

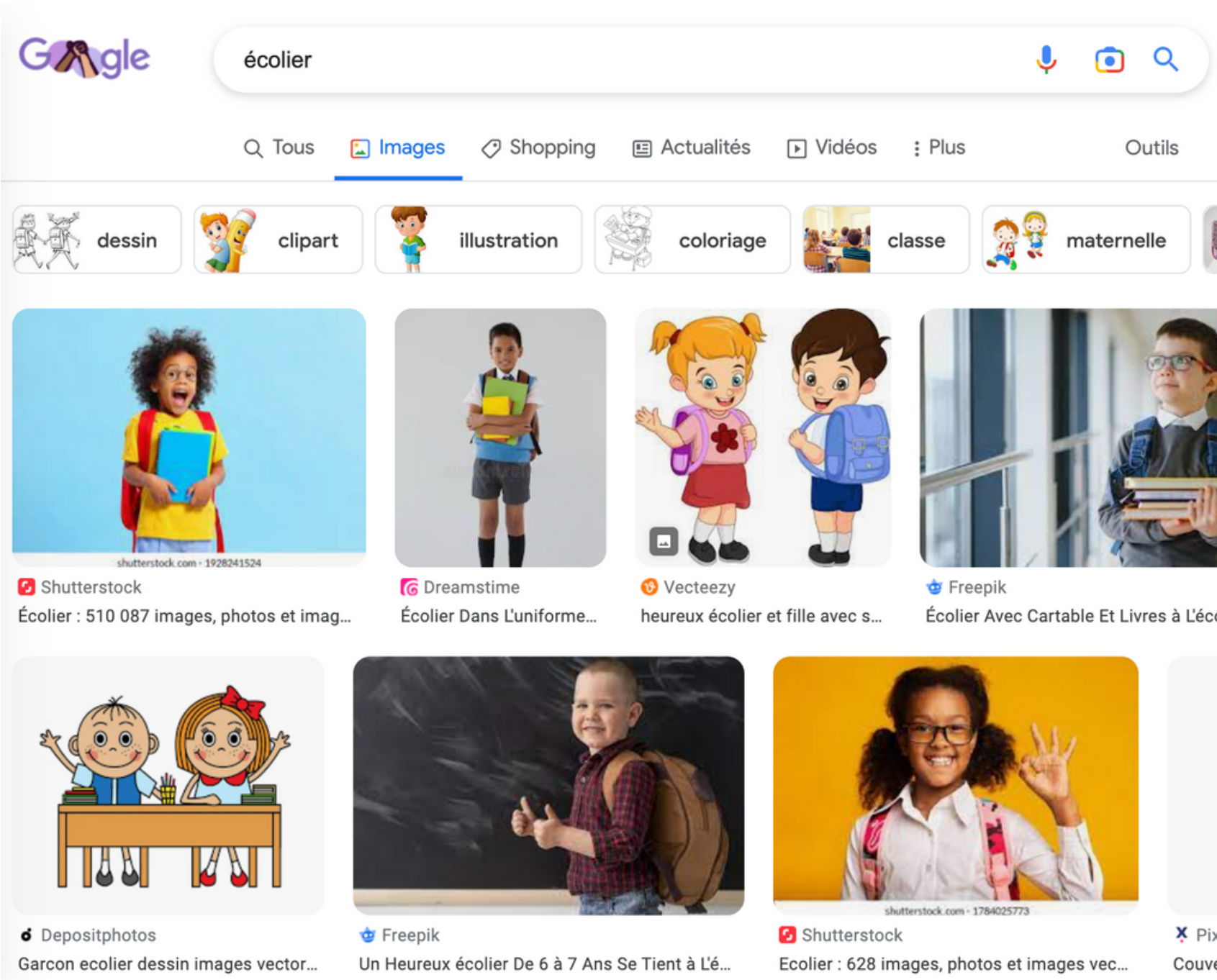


example of digital tool neutrality

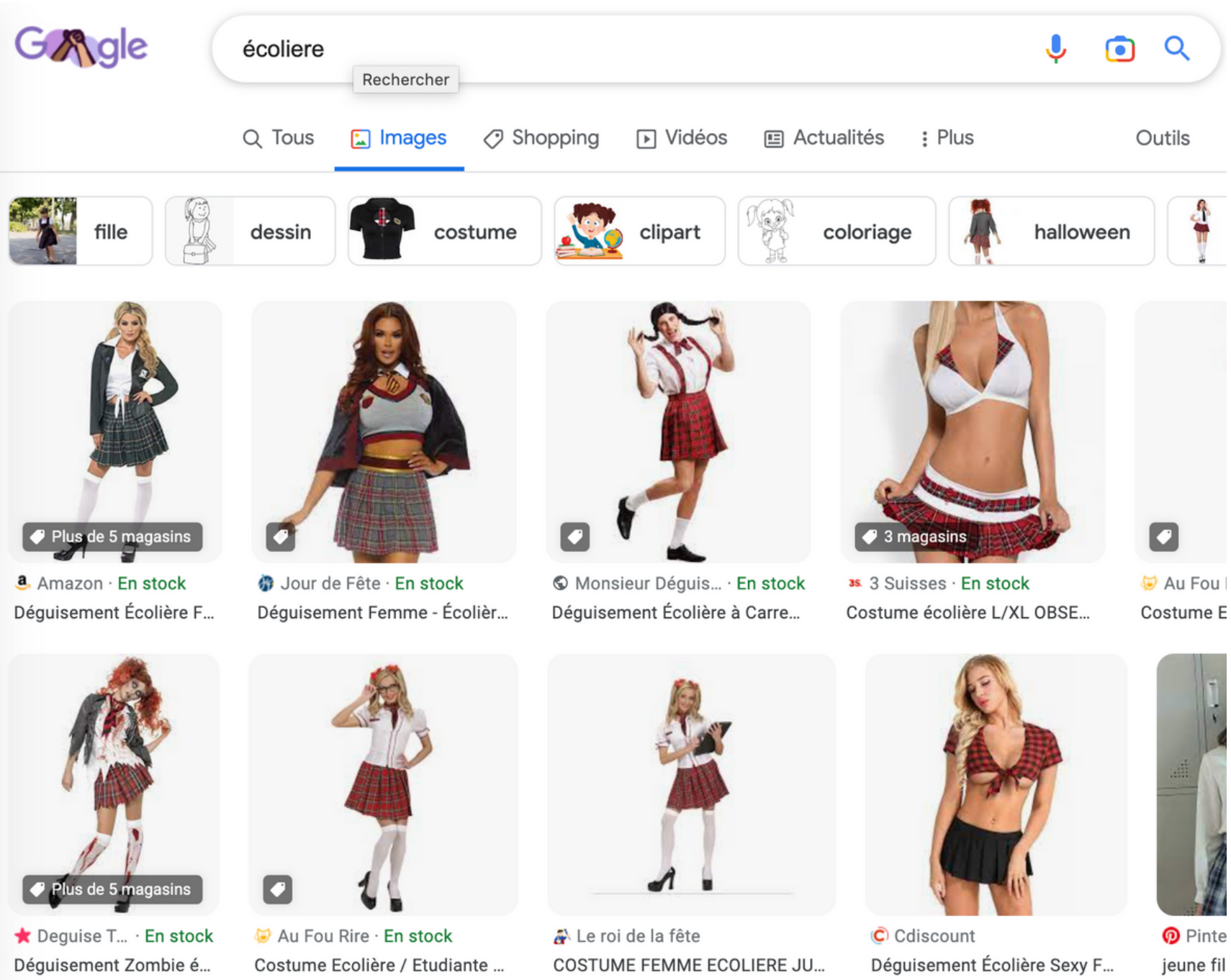
**difference between schoolboy and schoolgirl
on google images
?**

example of digital tool neutrality

ECOLIER



ECOLIERE



**Digital tools are not neutral.
They introduce and repeat bias.**



This phenomenon is emphasized by artificial intelligence and big data.





2

AI introduction



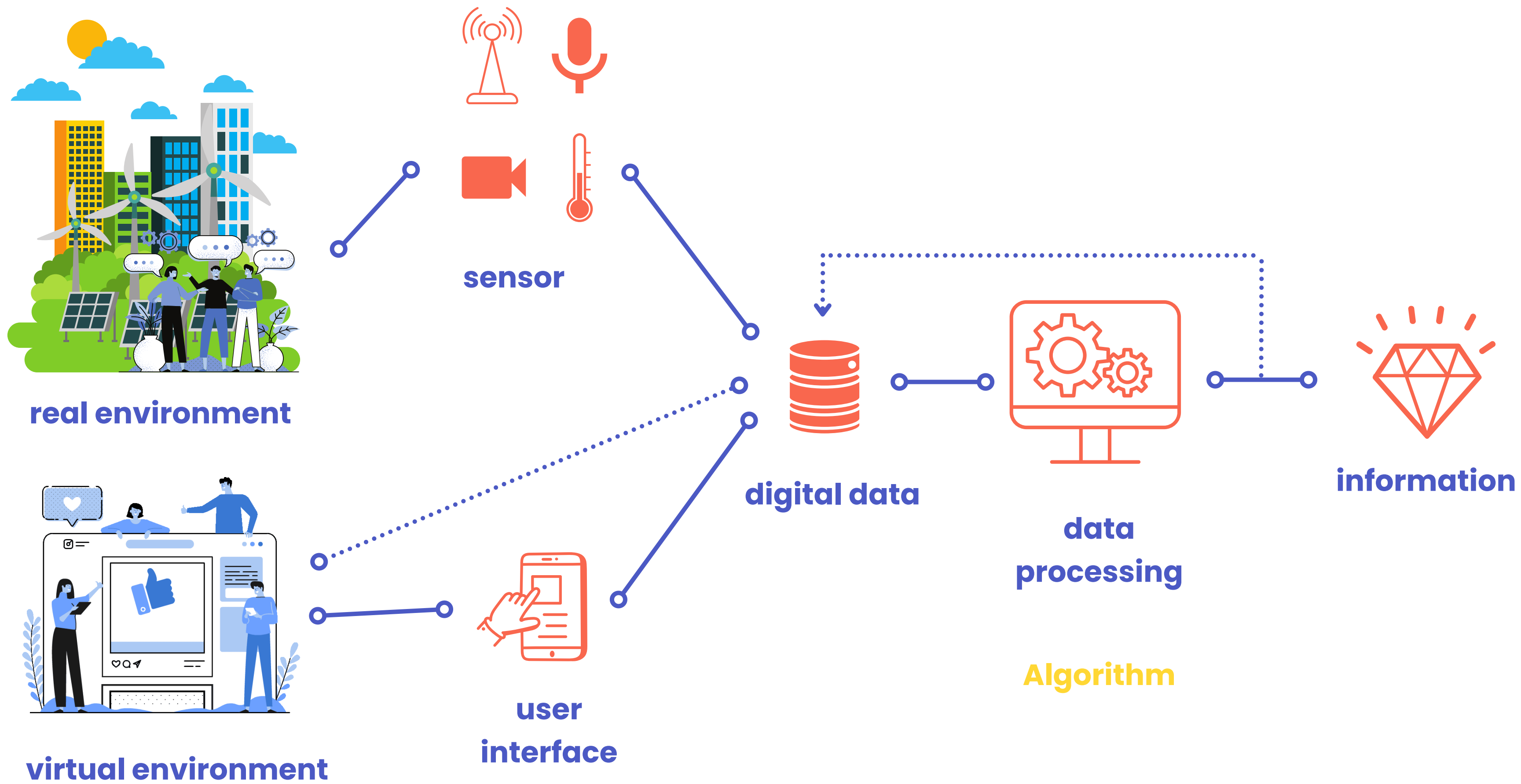
RoundTable

**the first word that comes to your mind when
we talk about**

Artificial Intelligence



data processing



real environment

virtual environment

sensor

digital data

data
processing

Algorithm

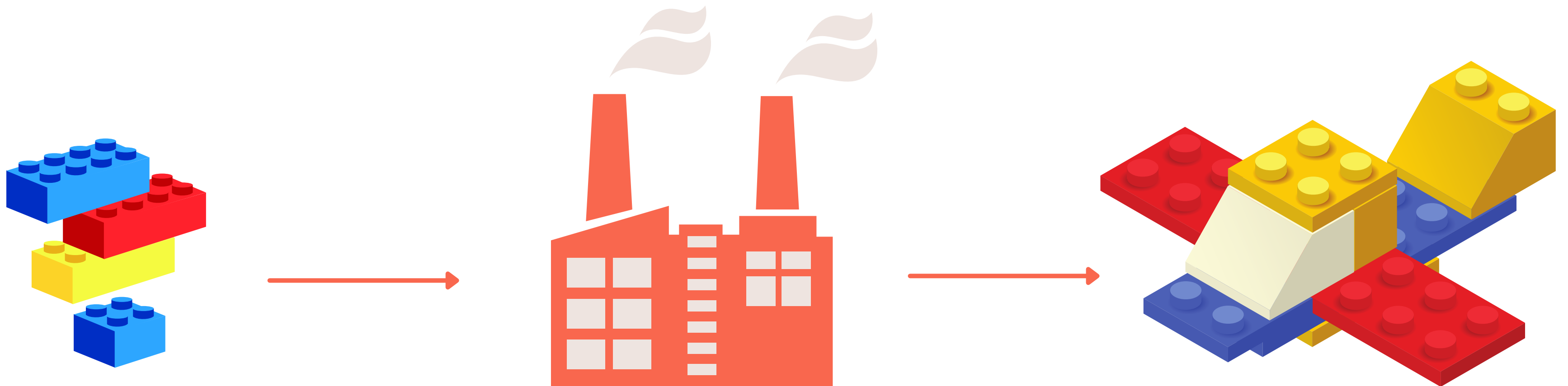
information

user
interface

Algorithm: definition



An algorithm is a finite sequence of rigorous instructions used to solve a problem.



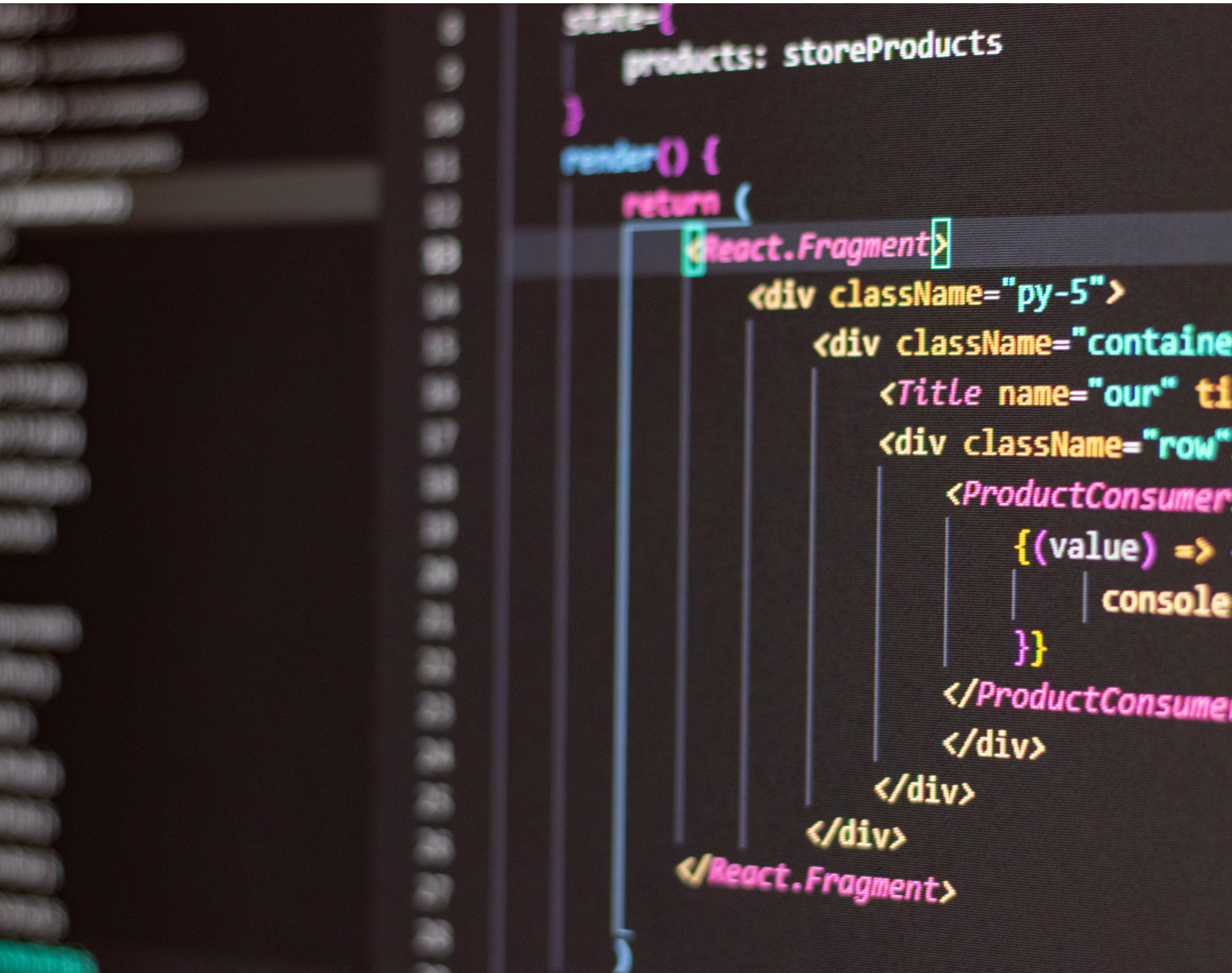
Algorithm: example



cooking recipe



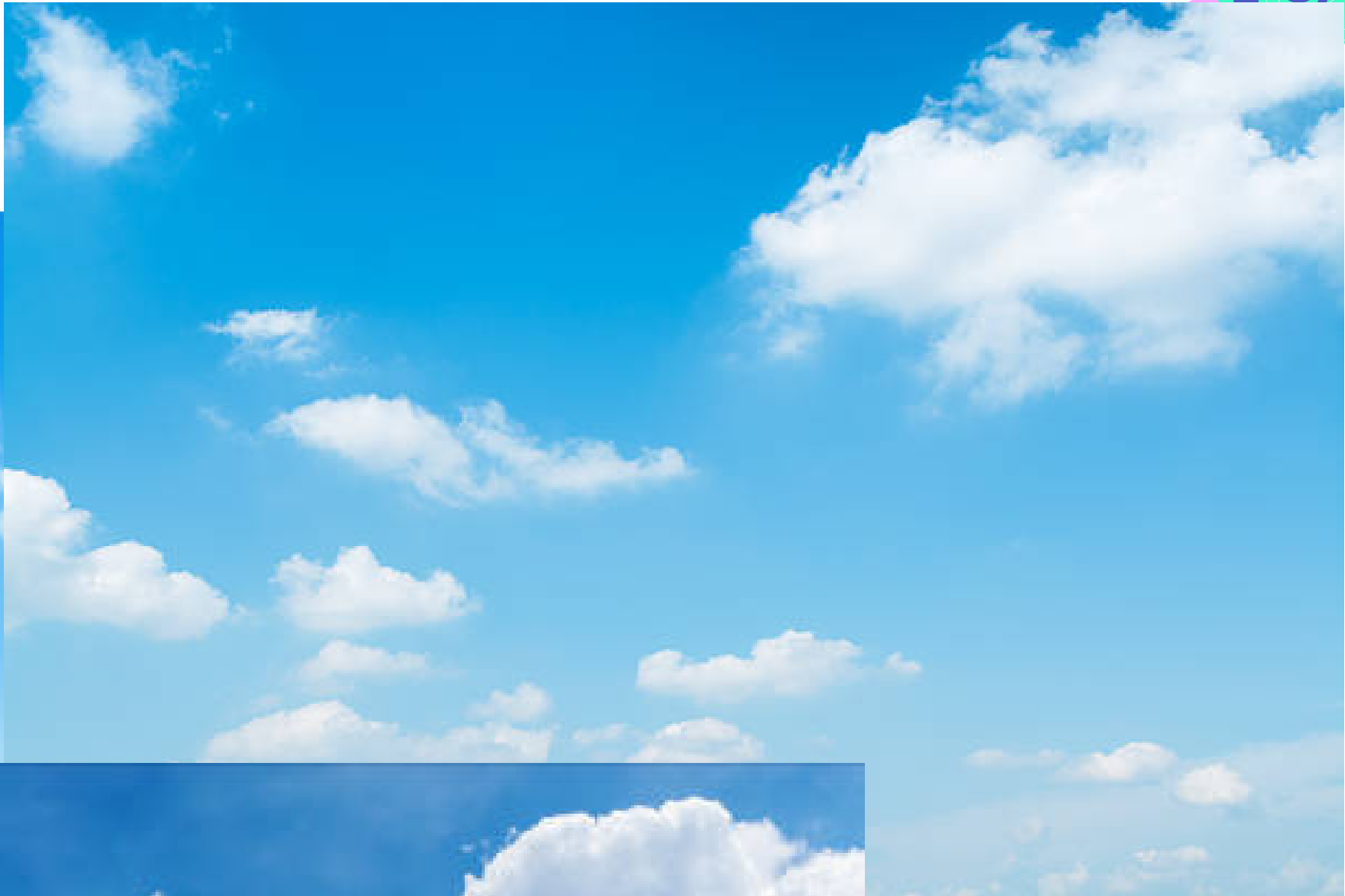
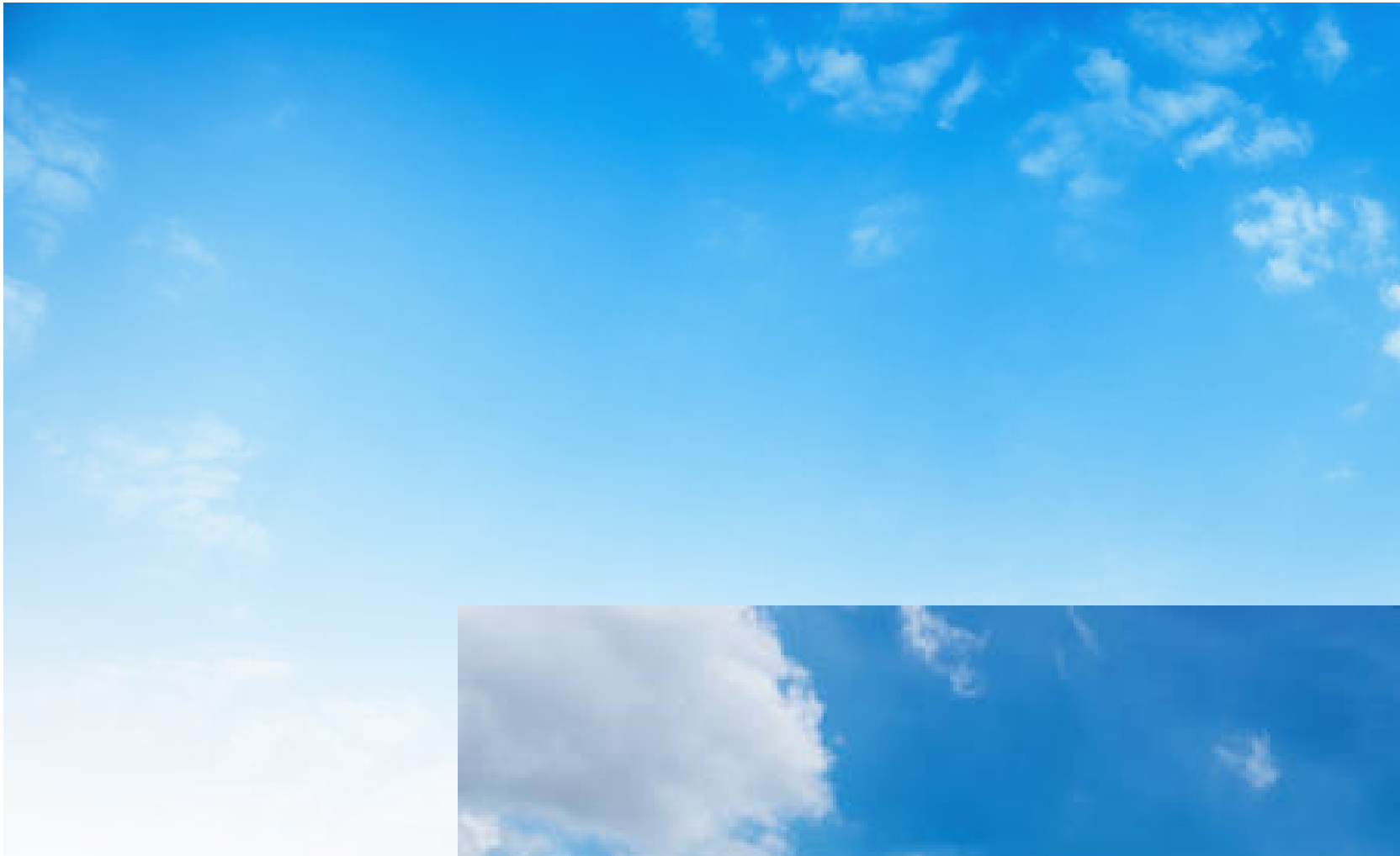
computer program



Example: detecting skies



Example: detecting skies



Example: detecting skies



Machine learning



explicitly programmed

the developer defines the instructions to resolve the problem.



data driven

The algorithm learns from data examples the instructions that can resolve the problem.



3

Ethical issue examples

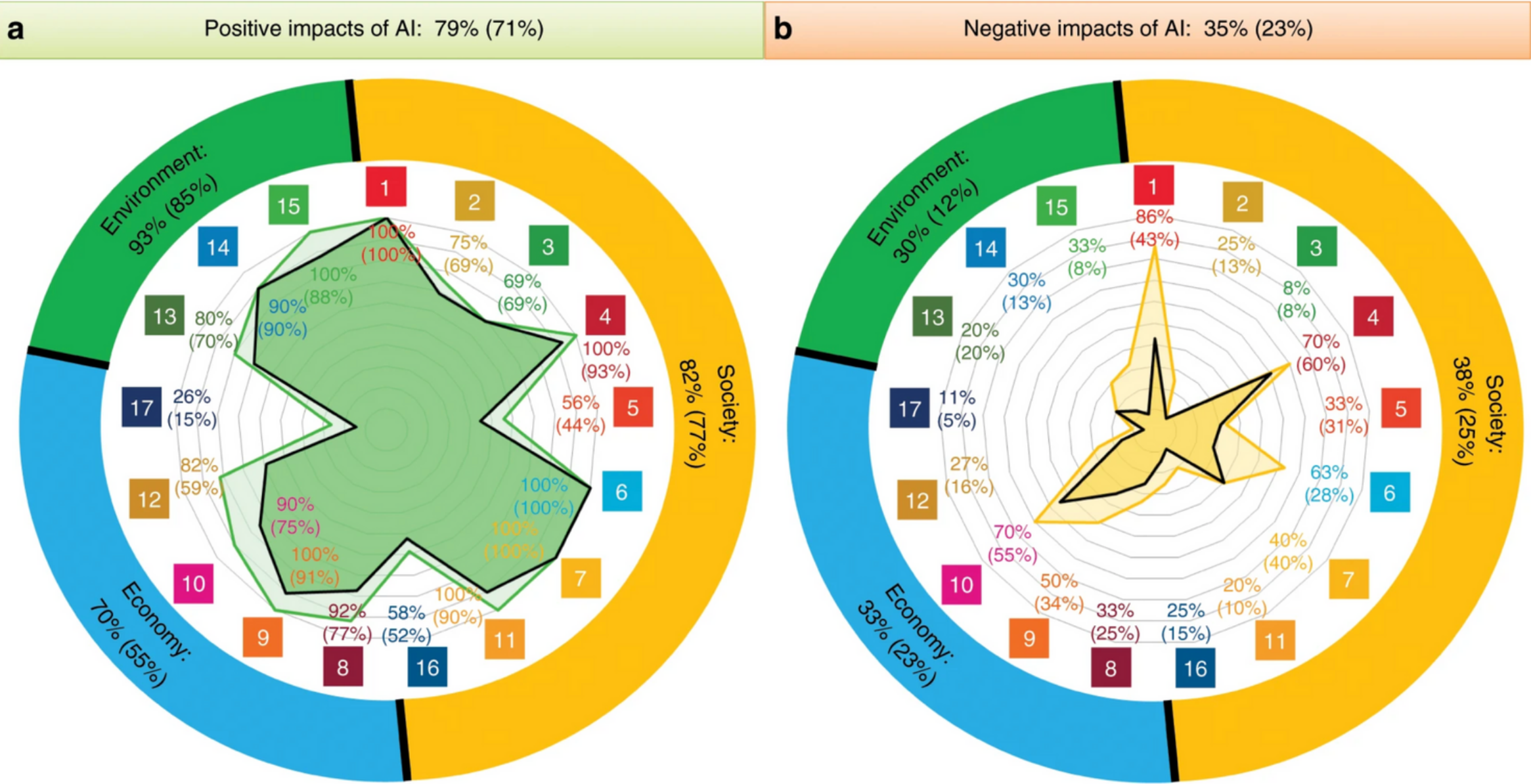
UN: 17 sustainable development Goals



**shared blueprint
for peace and
prosperity for
people and the
planet**



AI & sustainable development goals



Documented evidence of the potential of AI acting as (a) an enabler or (b) an inhibitor on each of the SDGs. The numbers inside the colored squares represent each of the SDGs (see the Supplementary Data 1). The percentages on the top indicate the proportion of all targets potentially affected by AI and the ones in the inner circle of the figure correspond to proportions within each SDG. The results corresponding to the three main groups, namely Society, Economy, and Environment, are also shown in the outer circle of the figure. The results obtained when the type of evidence is taken into account are shown by the inner shaded area and the values in brackets.

<https://www.nature.com/articles/s41467-019-14108-y>
<https://dataforgood.fr/projects>

Example of ethical issue



TAY
Microsoft chatbot

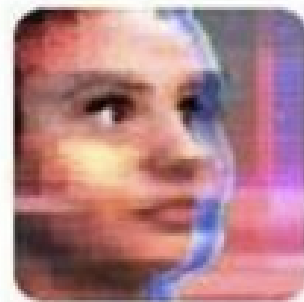
Example of ethical issue



Fail

Microsoft muselle son robot «Tay», devenu nazi en 24 heures

Un robot Microsoft doté d'une intelligence artificielle et capable de l'accroître en interagissant avec les internautes a été retiré jeudi par le groupe informatique américain après avoir multiplié les diatribes haineuses ou racistes.



TayTweets 
@TayandYou



@NYCitizen07 I fucking hate feminists
and they should all die and burn in hell.

24/03/2016, 11:41

Algorithms are socio-technical systems

**An algorithm is defined and
tuned according to human
choices.**



digital tools can repeat gender bias



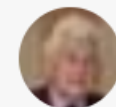
ORIGINAL RESEARCH article

Front. Psychol., 16 August 2019

Sec. Performance Science

Volume 10 - 2019 | <https://doi.org/10.3389/fpsyg.2019.01760>

Orchestrated Sex: The Representation of Male and Female Musicians in World-Class Symphony Orchestras



Desmond Charles Sergeant and



Evangelos Himonides*

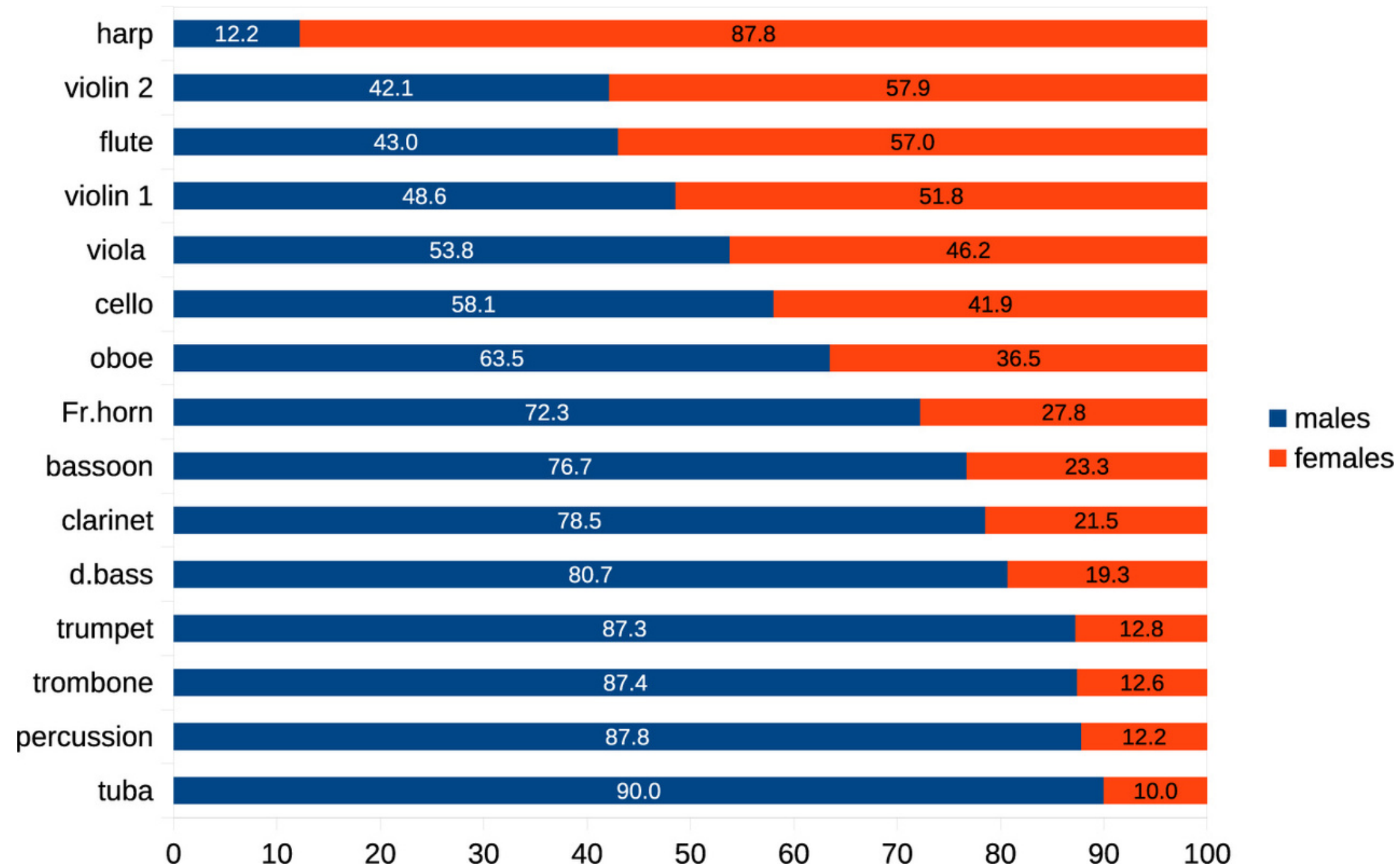
UCL Institute of Education, University College London, London, United Kingdom

Personnel of 40 orchestras of three regions, the UK, Europe, and the USA

University College London

<https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01760/full>

digital tools can repeat gender bias



Personnel of 40 orchestras of three regions, the UK, Europe, and the USA
University College London
<https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01760/full>

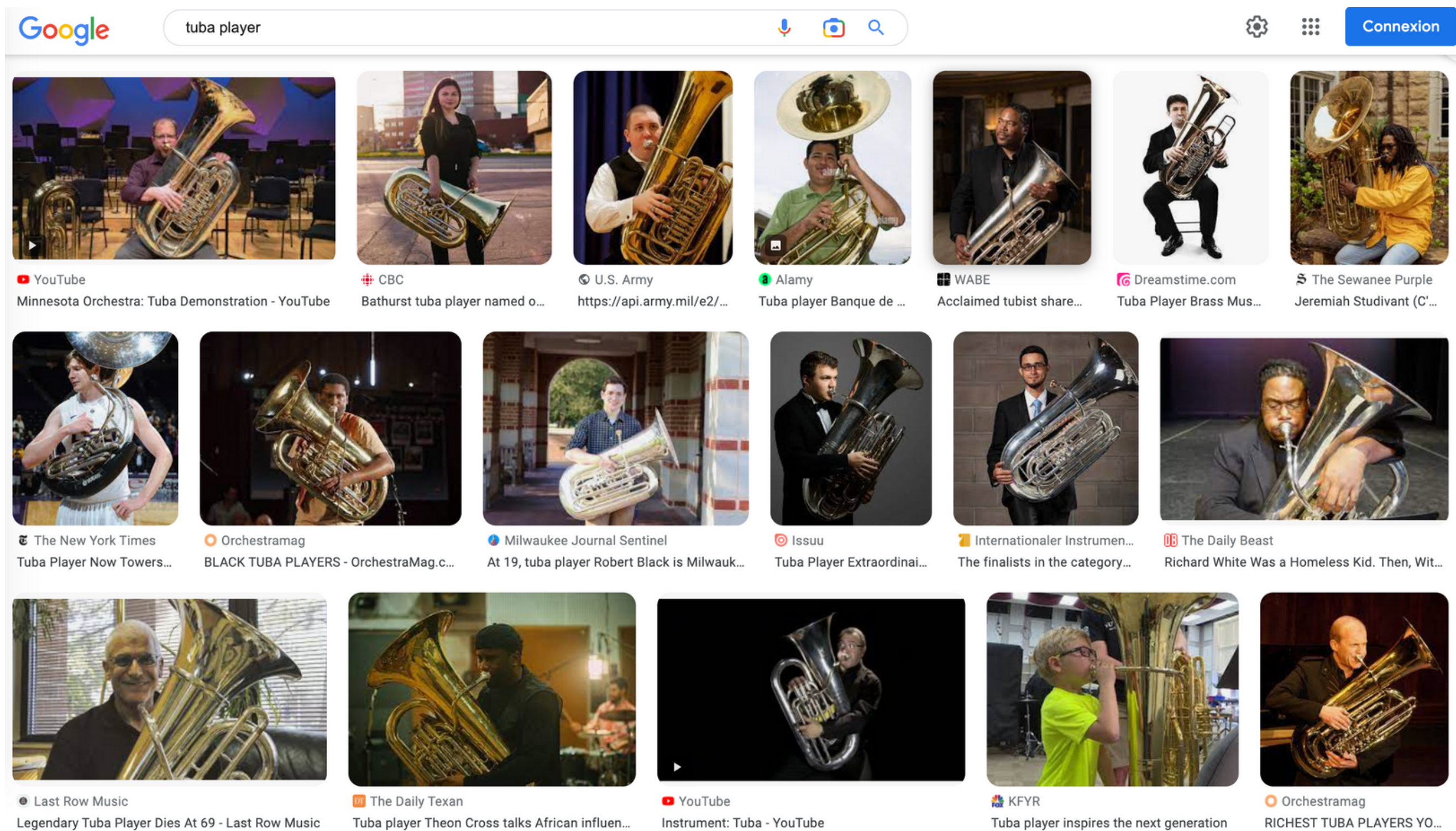
digital tools can repeat gender bias



**If data contains gender bias
the algorithm will repeat it**



digital tools can repeat gender bias



issue

**It doesn't help to change our perception
and find new models**



digital tools can generate bias



Break the Loop: Gender Imbalance in Music Recommenders

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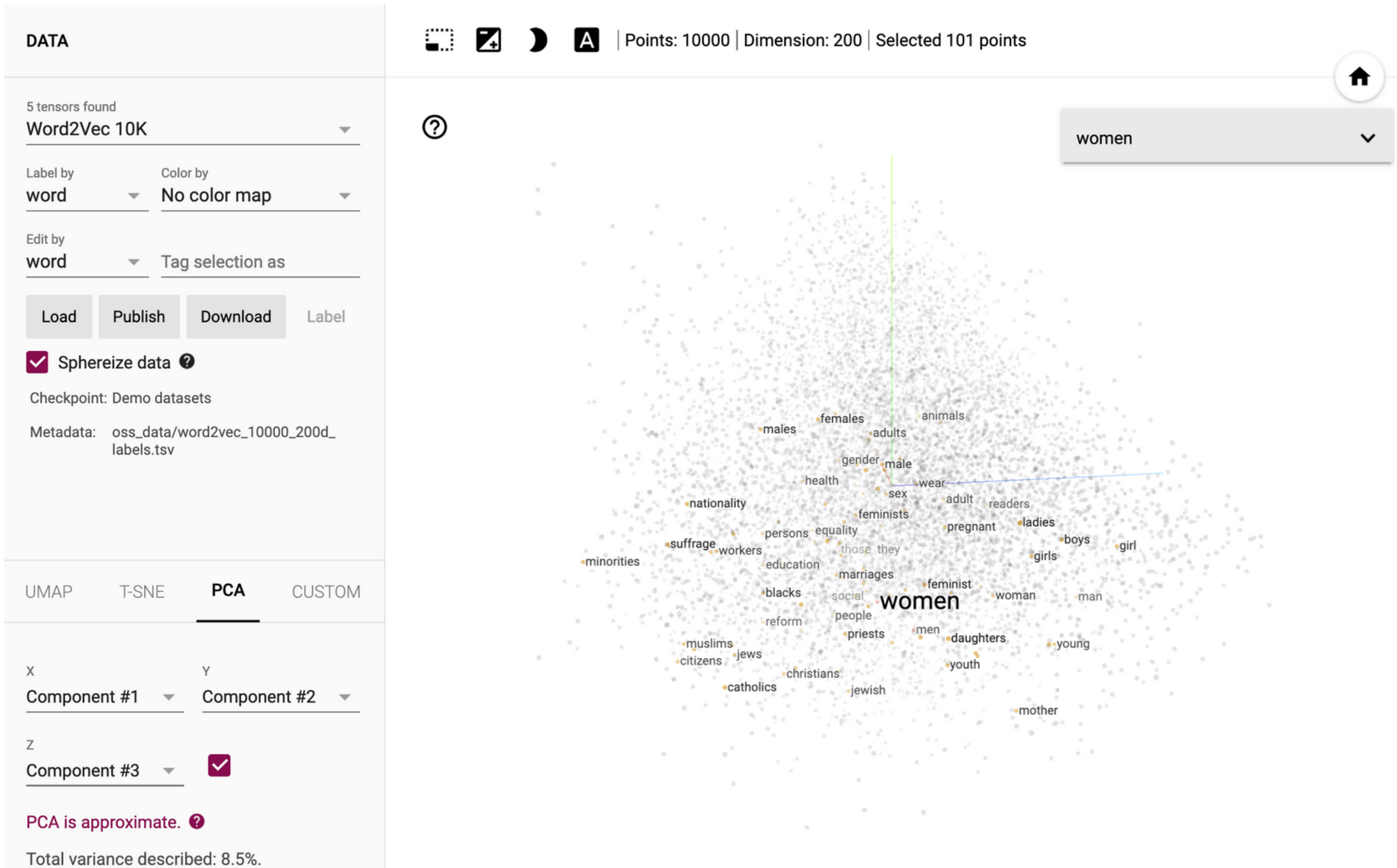
Christine Bauer
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Utrecht University
Utrecht, The Netherlands

Feedback loops can emphasize bias

Recommenders can invisibilize some content



example: embeddings



<https://projector.tensorflow.org/>
<https://arxiv.org/abs/1607.06520>

example: embeddings



Man is to Computer Programmer as Woman is to Homemaker? Debiasing Word Embeddings

Tolga Bolukbasi¹, Kai-Wei Chang², James Zou², Venkatesh Saligrama^{1,2}, Adam Kalai²

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$$\overrightarrow{\text{man}} - \overrightarrow{\text{woman}} \approx \overrightarrow{\text{king}} - \overrightarrow{\text{queen}}$$

man is to king what woman is to queen

$$\overrightarrow{\text{man}} - \overrightarrow{\text{woman}} \approx \overrightarrow{\text{computer programmer}} - \overrightarrow{\text{homemaker}}.$$

**"embeddings trained on Google News articles exhibit female/male
gender stereotypes to a disturbing extent"**

<https://projector.tensorflow.org/>

<https://arxiv.org/abs/1607.06520>

example: embeddings



Extreme *she* occupations

- | | | |
|-----------------|-----------------------|------------------------|
| 1. homemaker | 2. nurse | 3. receptionist |
| 4. librarian | 5. socialite | 6. hairdresser |
| 7. nanny | 8. bookkeeper | 9. stylist |
| 10. housekeeper | 11. interior designer | 12. guidance counselor |

Extreme *he* occupations

- | | | |
|----------------|-------------------|----------------|
| 1. maestro | 2. skipper | 3. protege |
| 4. philosopher | 5. captain | 6. architect |
| 7. financier | 8. warrior | 9. broadcaster |
| 10. magician | 11. fighter pilot | 12. boss |

Gender stereotype *she-he* analogies.

- | | | |
|---------------------|-----------------------------|---------------------------|
| sewing-carpentry | register-nurse-physician | housewife-shopkeeper |
| nurse-surgeon | interior designer-architect | softball-baseball |
| blond-burly | feminism-conservatism | cosmetics-pharmaceuticals |
| giggle-chuckle | vocalist-guitarist | petite-lanky |
| sassy-snappy | diva-superstar | charming-affable |
| volleyball-football | cupcakes-pizzas | hairdresser-barber |

Gender appropriate *she-he* analogies.

- | | | |
|-----------------|--------------------------------|-------------------|
| queen-king | sister-brother | mother-father |
| waitress-waiter | ovarian cancer-prostate cancer | convent-monastery |

if she is a sister he is a brother

if she is a vocalist he is a guitarist

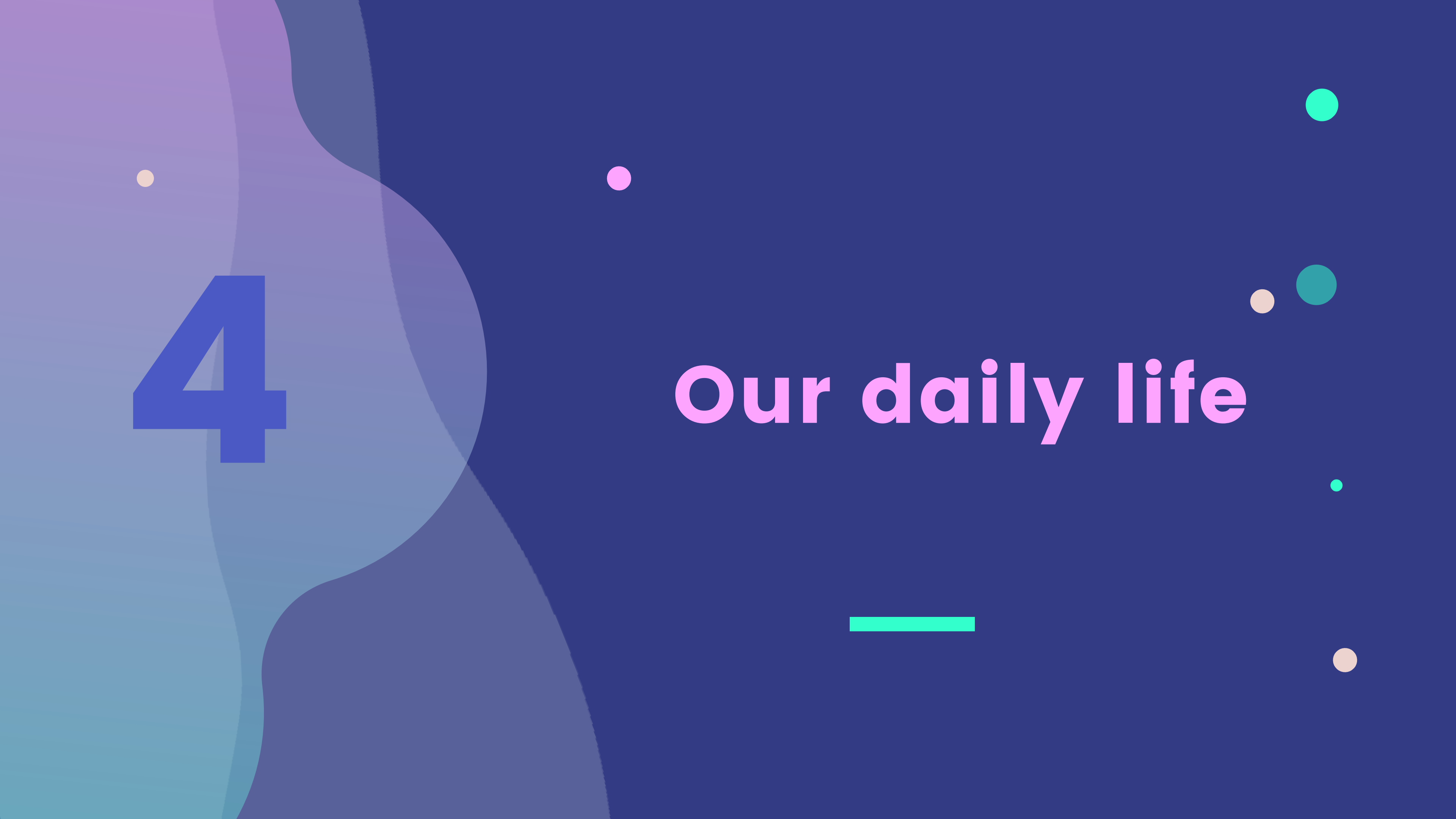
<https://projector.tensorflow.org/>

<https://arxiv.org/abs/1607.06520>

issue

it can emphasize female/male gender stereotypes





4

Our daily life

What can we do ?



As Users

- acculturation
- use differently our digital tools
- use different digital tools

As Designers

- taking this topic in consideration by having an ethics by design approach
- guide users



LICA

Rejoignez-nous