



Building meaning through Data Visualization

Aurore Paligot, PhD

IoT Sensemakers Amsterdam - 18 November 2020

Hello!

I am [Aurore Paligot](#)
and I create stuff with data.
Here is my [website](#).





research

data

**art
&
humanities**

code

3

2006

2008

2010

2012

2014

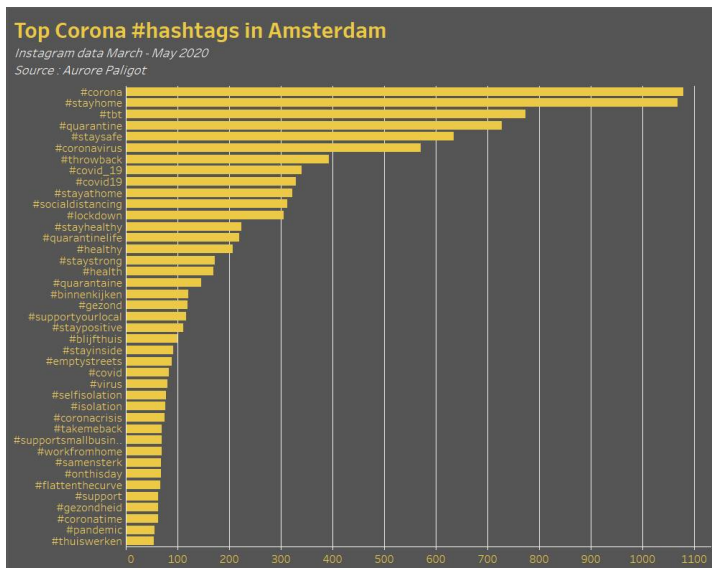
2016

2018

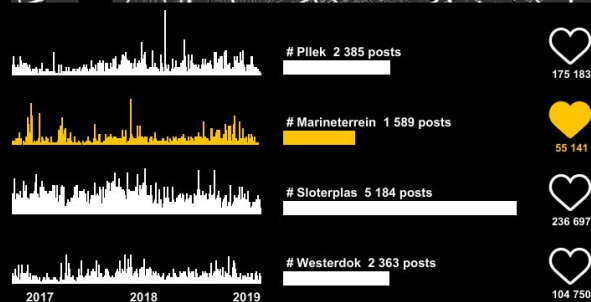
2020

Insta.gram the dam

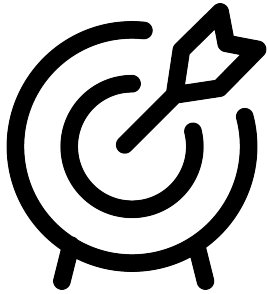
#SamenSterk



#UrbanBeaches

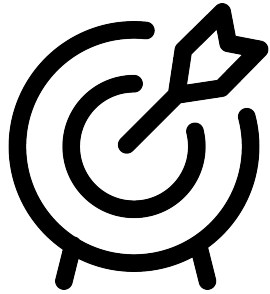


90% of the information transmitted to our human brain is visual. The human brain can process visuals 60.000 times faster than they do to text.



Why Data Visualization is important?

“It provides a quick and effective way to communicate information in a universal manner using Visual information.”



Why Data Visualization is important?

~~“It provides a quick and effective way to communicate information in a universal manner using Visual information.”~~

**Data visualization is the
construct of a construct**

Exploration



Communication



Data Project

Data IN

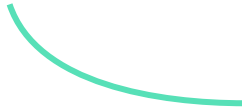
Data OUT

I. Data
Quality

III. Error
Analysis

II. Data
Exploration

Research



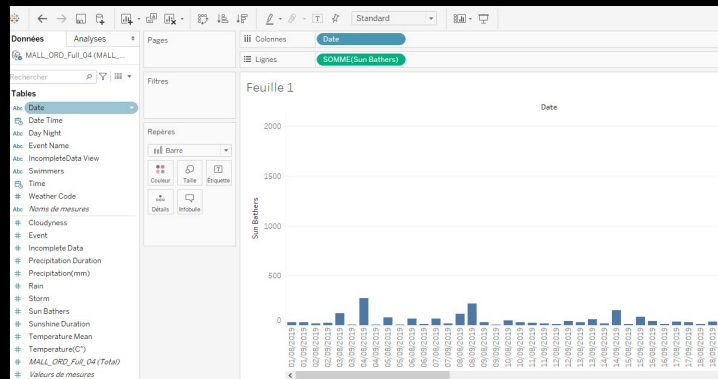
I. Data Quality

Visualize A.S.A.P. I

Tip 1 : Quick descriptive statistics of the Data Set

Tip 2 : Spot problems (Missing Values, Errors, Formats)

Tip 3 : Quick matrices & color mapping



I. Data Quality

Visualize A.S.A.P. II

Benefit 1 : Be proactive with the data and report bugs & problems

Benefit 2 : Gain of time
GUARANTEED

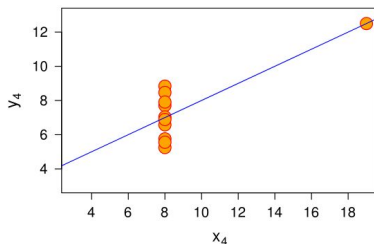
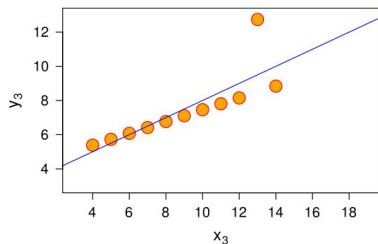
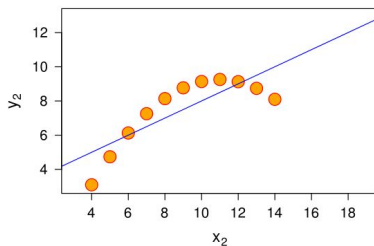
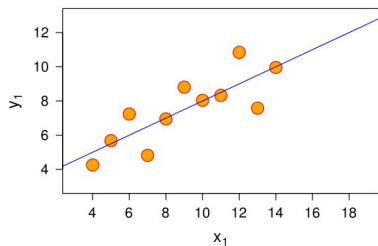
Benefit 3 : Better overview of the data



Don't trust Ryan Gosling meme

II. Data Exploration

Anscombe's Quartet



Identical summary statistics

- Mean
- Variance
- Correlation coefficient
- Line of best fit

Very different data sets

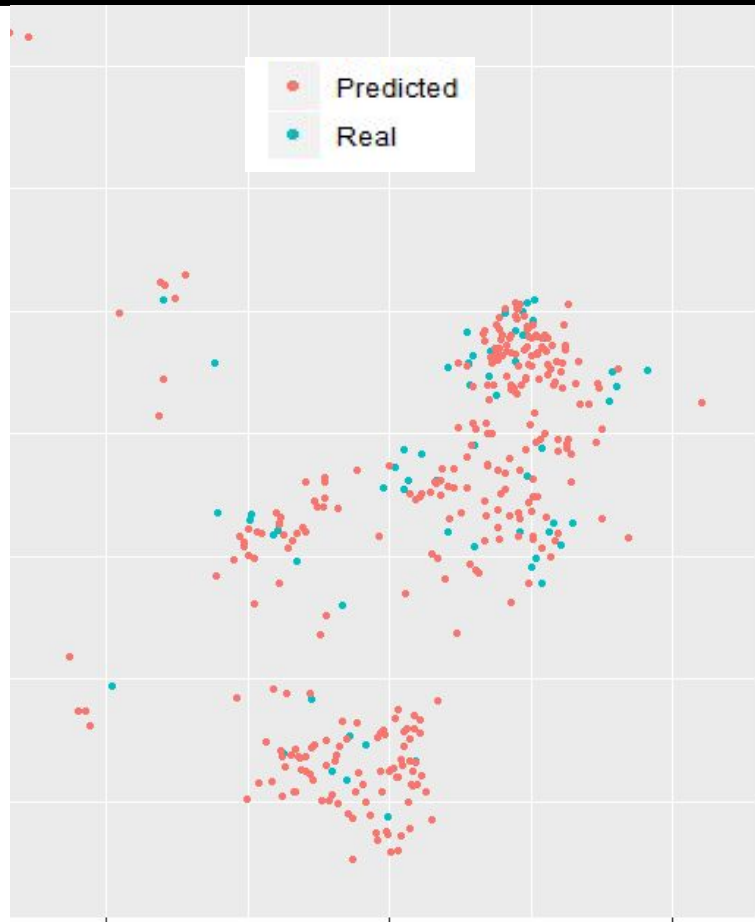
Tip : focus on patterns, trends and outliers

Source : [Wikipedia](https://en.wikipedia.org/wiki/Anscombe%27s_quartet)

III. Error Analysis

Model improvement

- Detect where the model fails
- Test hypotheses
- Reiterate



I. Strategy

II. Effectivity

III. Long Term Goals

Stakeholders



*“The purpose of
visualization is **insight**,
not pictures”*

Ben Shneiderman

Business Intelligence

“Business intelligence (BI) combines business analytics, data mining, data visualization, data tools and infrastructure, and best practices to help organizations to make more data-driven decisions.” [Tableau](#)

I. Strategy

- Why?
- Who?
- How?

II. Effectivity

- Various End Users
- Flexibility
- Priorities

III. Long term goals

- Documentation
- Maintenance
- Transparency

I. Make a mess

II. Think out of the box

III. Show your data

IV. Points of comparison

V. Challenge representations

VI. Tell a story

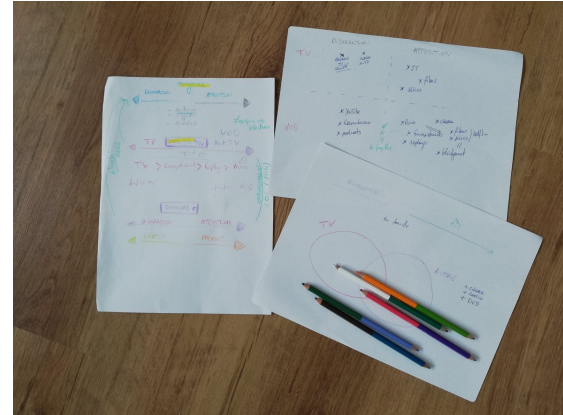
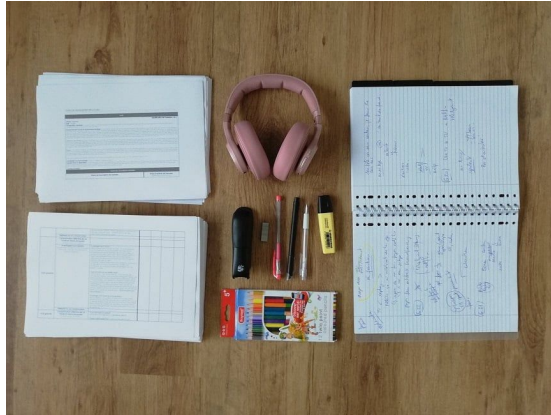
VII. Explain your data

VIII. Color Blindness

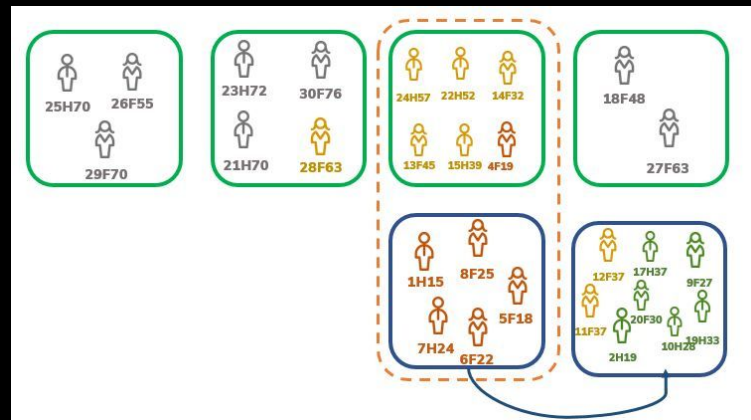
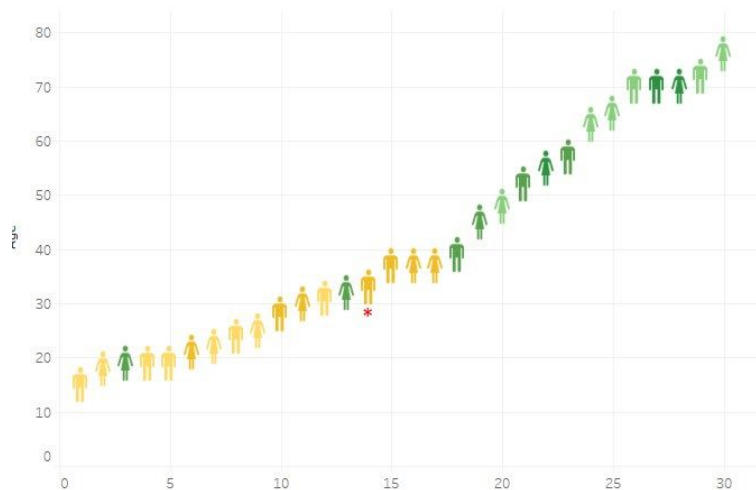
IX. Open Data

Public

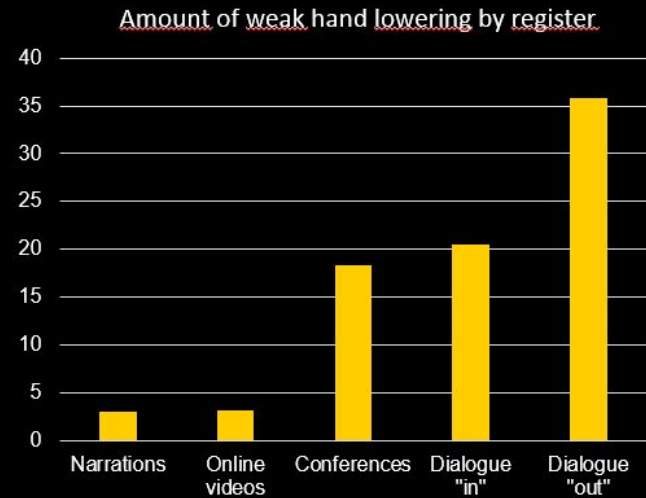
Make a mess



Think out of the box



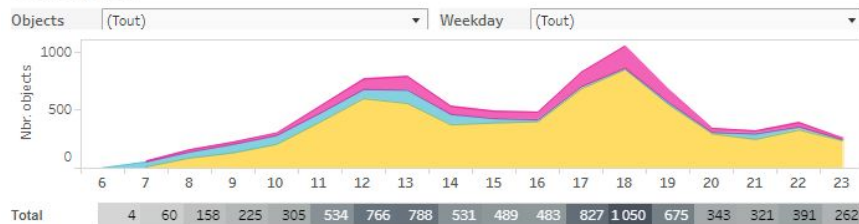
Show your Data I





Show your Data II

Count by hour



Object count by day and hour



Computer Vision detects bicycles, pedestrians and vehicles - Amsterdam



Seek points of comparison I

Omg. People stopped asking Google how to fall in love during Covid

• Tomber amoureux
Sujet

+

Dans tous les pays, 12 derniers mois

Évolution de l'intérêt pour cette recherche



12 months

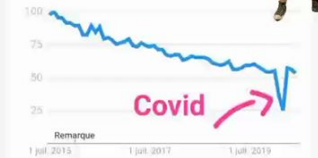
Falling in love more & more unpopular these days

• Tomber amoureux
Sujet

+ COMPARER

Dans tous les pays, Cinq dernières années

Évolution de l'intérêt pour cette recherche



5 years

Seek points of comparison II

Omg. People stopped asking Google how to fall in love during Covid

• Tomber amoureux
Sujet

+

Dans tous les pays, 12 derniers mois

Évolution de l'intérêt pour
cette recherche



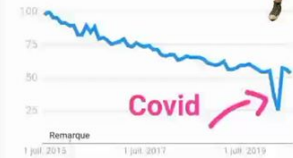
Falling in love more & more unpopular these days

• Tomber amoureux
Sujet

+ COMPARER

Dans tous les pays, Cinq dernières années

Évolution de l'intérêt pour
cette recherche



I might have found an explanation 😂

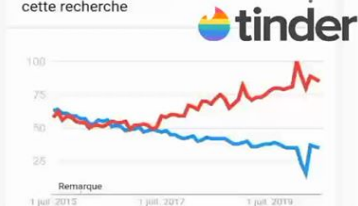
• Tomber amoureux
Sujet

• Tinder
Application

+ AJOUTER UNE COMPARAISON

Dans tous les pays, Cinq dernières années

Évolution de l'intérêt pour
cette recherche



Challenge traditional representations

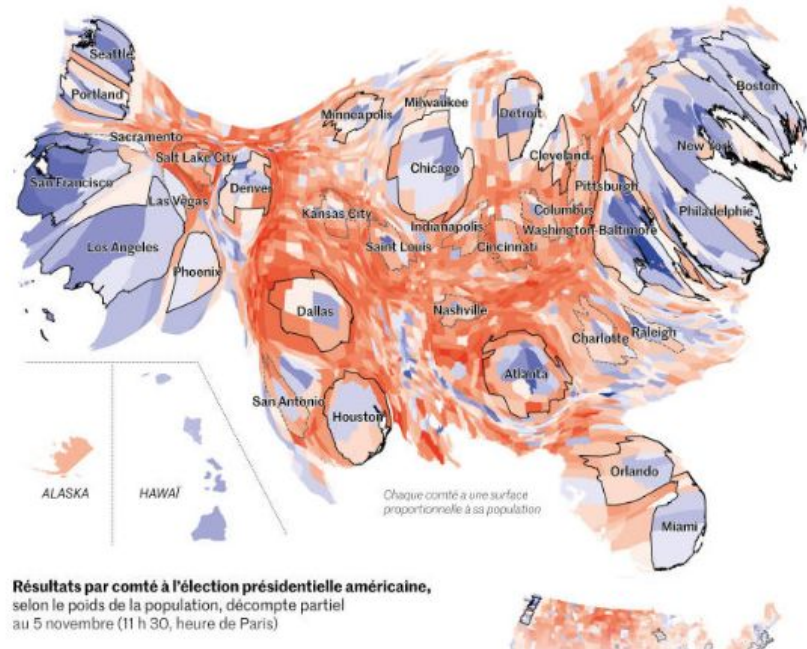
Source: [Try to impeach this](#)

Tell a story

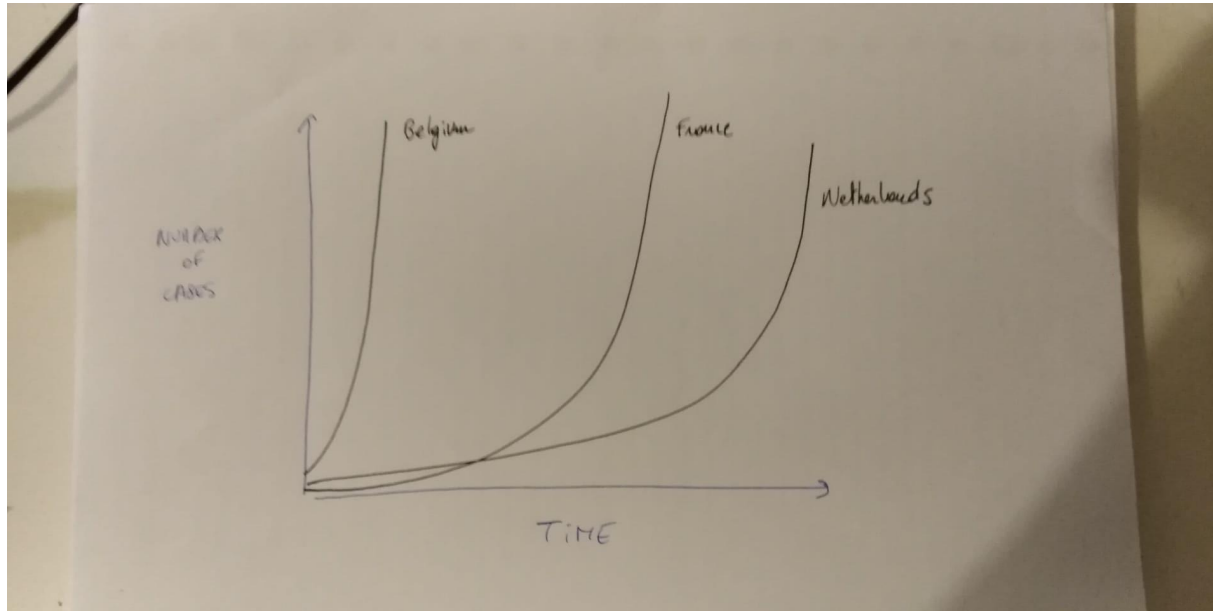
“Urban areas of more than 2 million people vote Joe Biden”

[Le Monde](#), 7 November 2020

Les aires urbaines de plus de 2 millions d'habitants votent Joe Biden



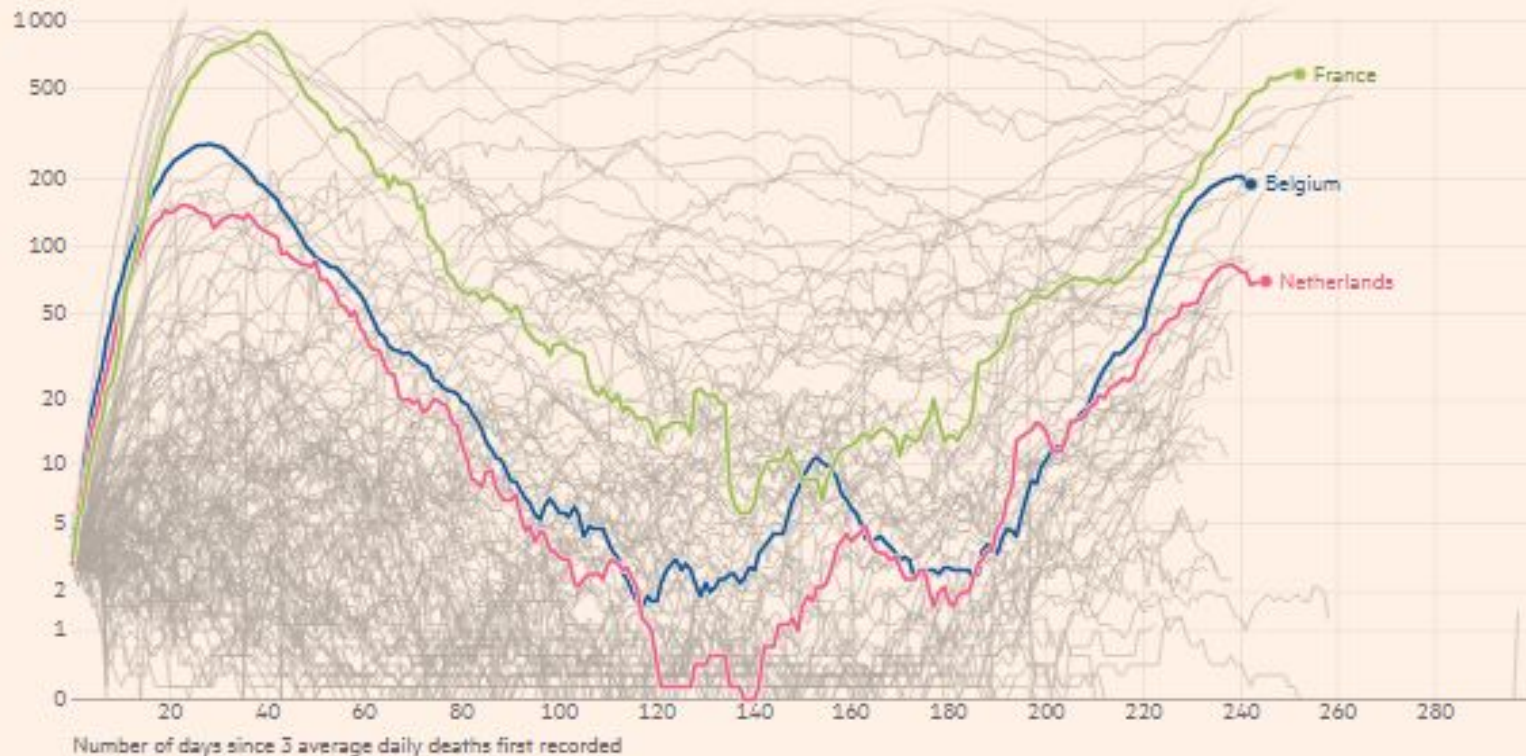
Explain your data I



New deaths attributed to Covid-19 in Belgium, Netherlands and France

Explain your data II

average daily deaths first recorded



Source: Financial Times analysis of data from the European Centre for Disease Prevention and Control, the Covid Tracking Project.

FINANCIAL TIMES

Source: Financial Times

Explain your data III

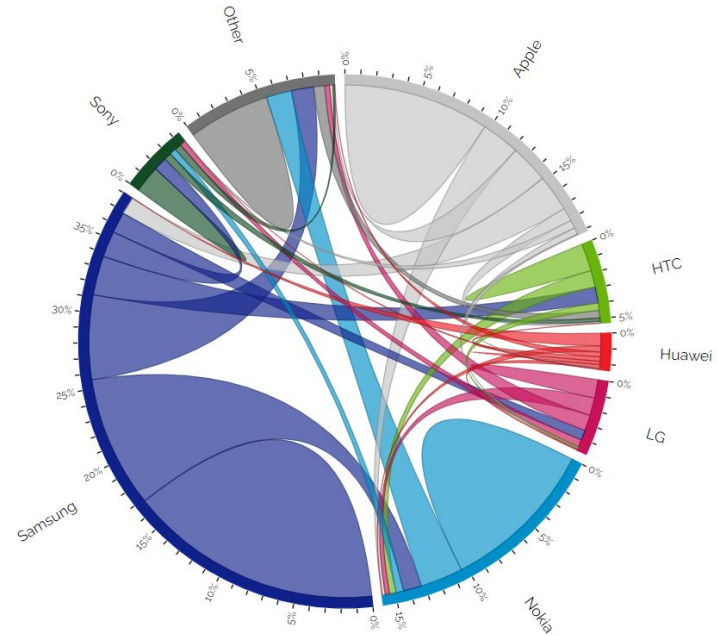


Source: [Covid tracker explained](#)

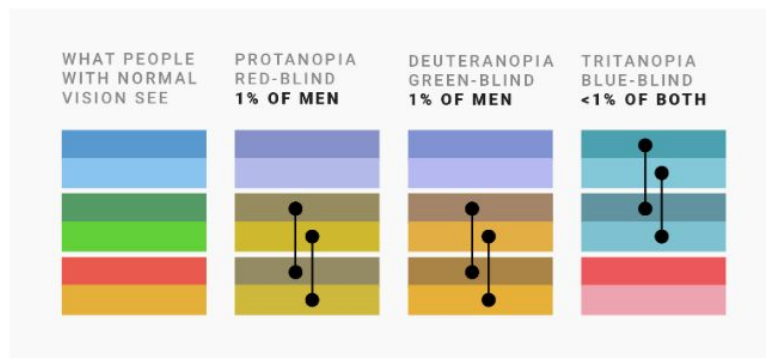
User Experience

Nadieh Bremer

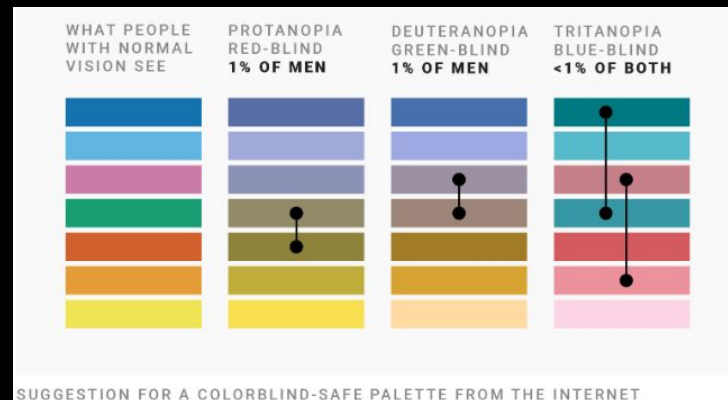
[Chord Diagram Storytelling](#)



Color Blindness I



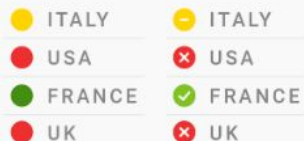
NOT IDEAL: COMBINING GREEN WITH ORANGE/RED OR BLUE



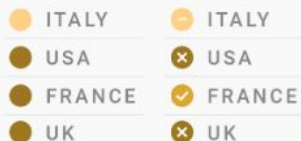
SUGGESTION FOR A COLORBLIND-SAFE PALETTE FROM THE INTERNET

Source : [What to consider when visualizing data for colorblind readers](#)

Color Blindness II



WHAT PEOPLE WITH NORMAL VISION SEE



WHAT GREEN-BLIND PEOPLE SEE
1% OF MEN



NOT IDEAL



BETTER

Source : [What to consider when visualizing data for colorblind readers](#)

Open Data

The screenshot shows the 'data.amsterdam.nl/datasets/zoek/' page. The header includes the 'Gemeente Amsterdam' logo, a navigation bar with 'Data en informatie', a search bar containing 'Alle zoekresul...', and links for 'Onderdelen', 'Over OIS', 'Feedback', 'Help', and 'Inlogge'. The left sidebar features a 'Categorieën' section with links to 'Alle zoekresultaten (24.403)', 'Dossiers (9)', 'Specials (40)', 'Kaarten (256)', 'Data (21.464)', 'Datasets (326)' (which is highlighted with a blue border), 'Publicaties (1.231)', and 'Artikelen (1.077)'. Below this is a 'Soorten' section with a radio button selected for 'Alles'. The main content area is titled 'Datasets (326 resultaten)' and lists three dataset entries: 'Armoedebestrijding Amsterdam' (updated today), 'Openbaar Subsidieregister Amsterdam' (updated 2 days ago), and 'Afval inzamelingsdagen huisvuil en grofvuil' (updated 5 days ago). Each entry includes a brief description and tags for 'Bestand' and 'Website'.

data.amsterdam.nl/datasets/zoek/

Gemeente Amsterdam Data en informatie Alle zoekresul... Zoek in datasets, artikelen en publicati

Onderdelen Over OIS Feedback Help Inlogge

Categorieën

- Alle zoekresultaten (24.403)
- Dossiers (9)
- Specials (40)
- Kaarten (256)
- Data (21.464)
- Datasets (326)**
- Publicaties (1.231)
- Artikelen (1.077)

Soorten

- ☒ Alles

Datasets (326 resultaten)

Armoedebestrijding Amsterdam
vandaag gewijzigd
Diverse datasets met statistieken van Onderzoek, Informatie en Statistiek. Thema: Werk en sociale zekerheid, Detailniveau: Amsterdam
Bestand

Openbaar Subsidieregister Amsterdam
2 dagen geleden gewijzigd
Met het openbaar subsidieregister verbetert Amsterdam de transparantie over de subsidies die de gemeente verstrekt. Het register bevat alle ...
Bestand Website

Afval inzamelingsdagen huisvuil en grofvuil
5 dagen geleden gewijzigd
Afval ophaalgebieden/inzamelingsdagen als gebieden voorzien van: van/tot tijdstip van aanbieden aanbodwijze frequentie van ophalen in dagen...

Source: [Open Data Amsterdam](https://data.amsterdam.nl/datasets/zoek/)

The power to shape the narrative

The metrics and visualizations that we choose affect how we perceive the world. How to make people feel empowered and safe rather than powerless?

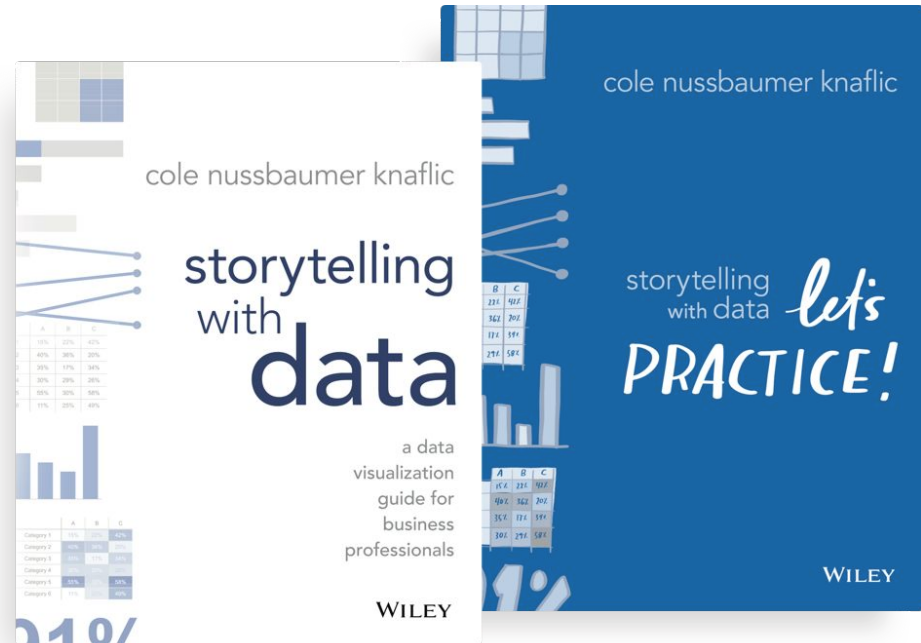
Number of contacts

Contact Duration

Same vs. different contacts

Good Read

[Storytelling with Data: A Data Visualization Guide for Business Professionals](#). Cole Nussbaumer Knaflic



References

- Dia 2 : [my website](#)
- Dia 4 : [insta.gram the dam](#)
- Dias 5-7: [Why Data Visualization?](#)
- Dia 12: [Anscombe's Quartet](#)
- Dia 16: [Business Intelligence](#)
- Dias 20-22 : [Weak Hand Lowering](#)
- Dia 23: [Camera Vision Graffiti](#)
- Dias 24-25: [Love in times of corona](#)
- Dia 26: [Try to impeach this](#)
- Dia 27: [Urban Areas vote Biden](#)
- Dia 29: [FT Covid tracker](#)
- Dia 30: [Covid tracker explained](#)
- Dia 31: [Chord Diagram](#)
- Dias 32-33: [Color Blindness](#)
- Dia 34: [Open Data Amsterdam](#)
- Dia 35: [Amsterdam Crowd Monitor](#)
- Dia 36: [Storytelling with Data](#)



Thank you

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