Expanding your graphical repertoire

2019 MIDFIELD Institute

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quantitative

Number of variables?
Continuous or discrete?

Number of observations?

categorical

Number of variables?
Nominal or ordinal?
Number of levels each?

strip plot

box and whisker plot

multiway

scatterplot

dot plot

line graph

conditioning plot

scatterplot matrix

parallel coordinate plot

cycle plot

quantile-quantile plot

Sankey diagram

diverging stacked bar
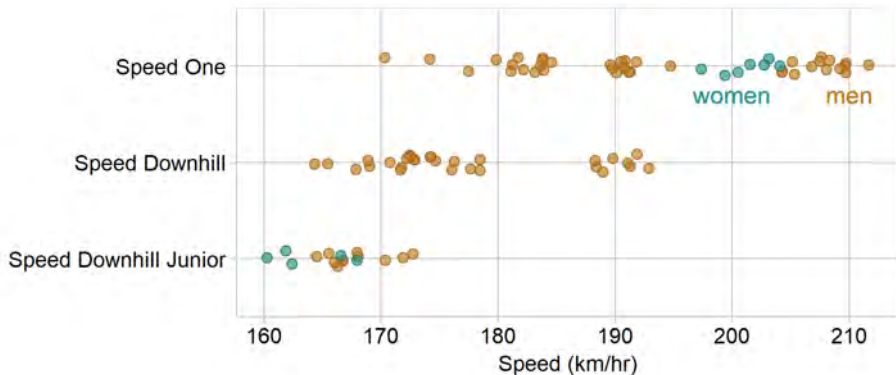
multivariate bar

micromaps

proportional symbol map

dot density map

Gallery of graph types

Strip plot — or jitter plot or 1D scatterplot

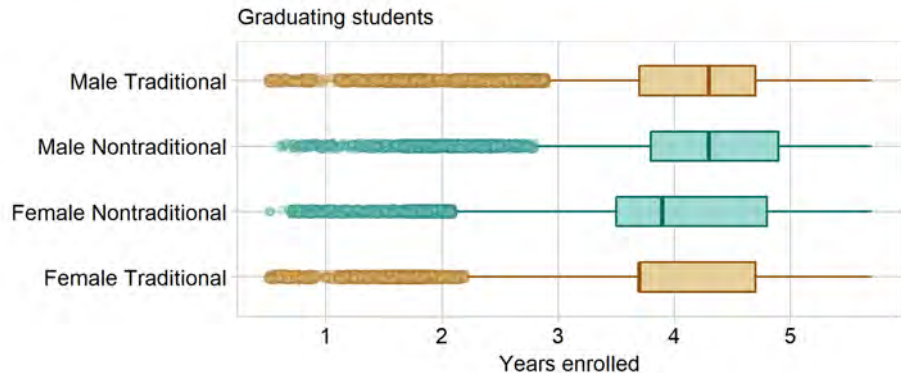Quantitative: Speed

Categorical: Event, sex

Box and whisker plot or box plot

Quantitative: Years enrolled

Categorical: Path + sex

Data source (MIDFIELD, 2019)
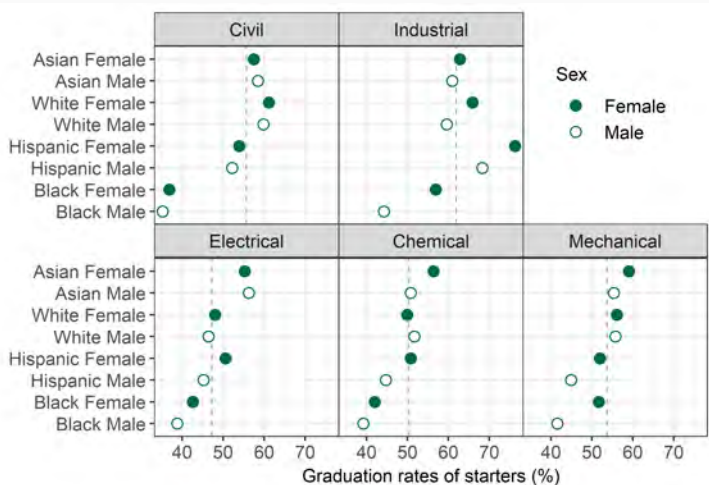
Multiway plot

Quantitative: Graduation rate

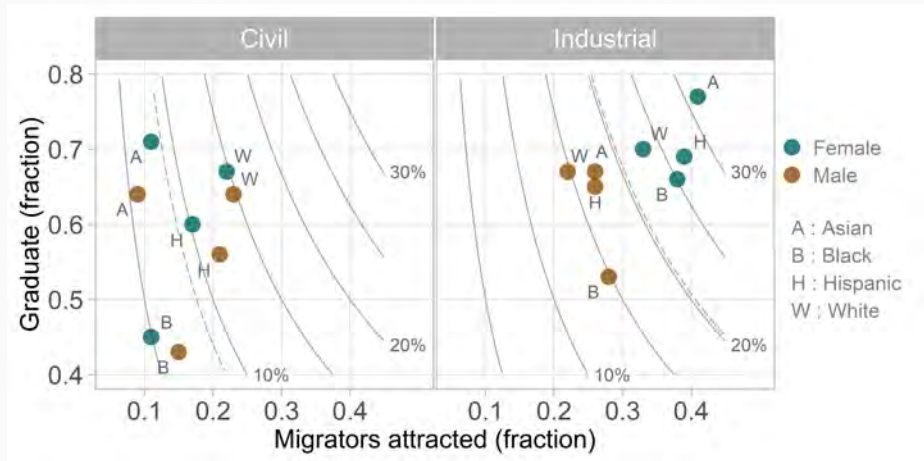Categorical: Race/ethnicity/sex, major

Scatterplot

Quantitative: Migrators attracted, migrators graduated
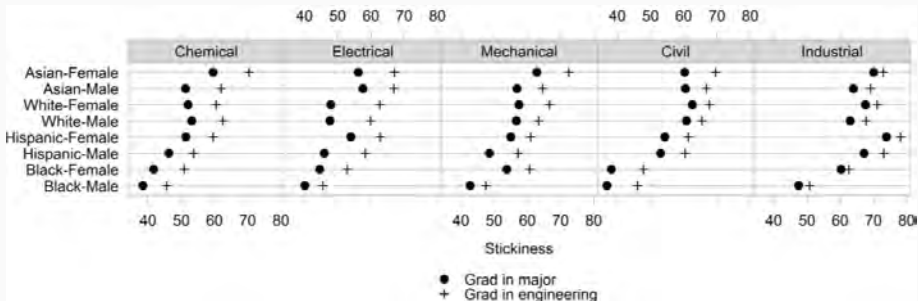
Categorical: Race/ethnicity, sex, major

Cleveland dot plot

Quantitative: Stickiness

Categorical: Race/ethnicity/sex, major, graduation destination

Data source (MIDFIELD, 2019)

Line graph

Death by Air Pollution in the United States Compared with the World
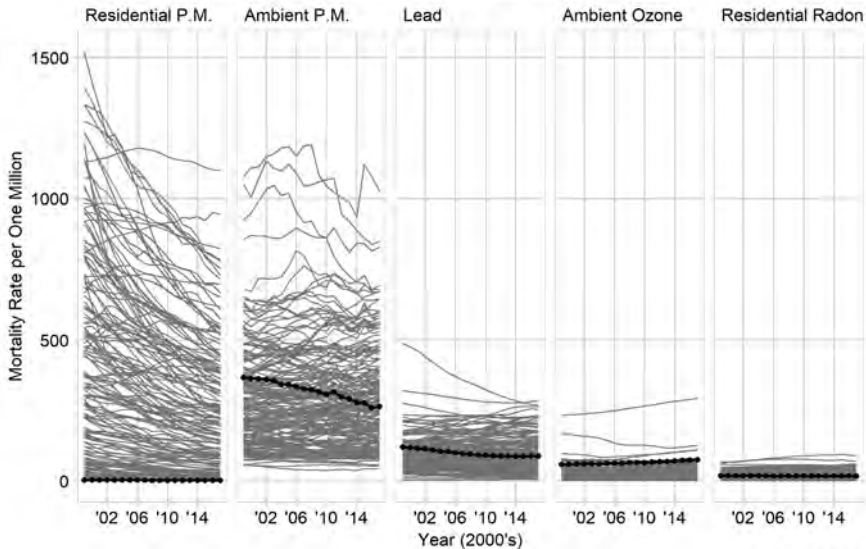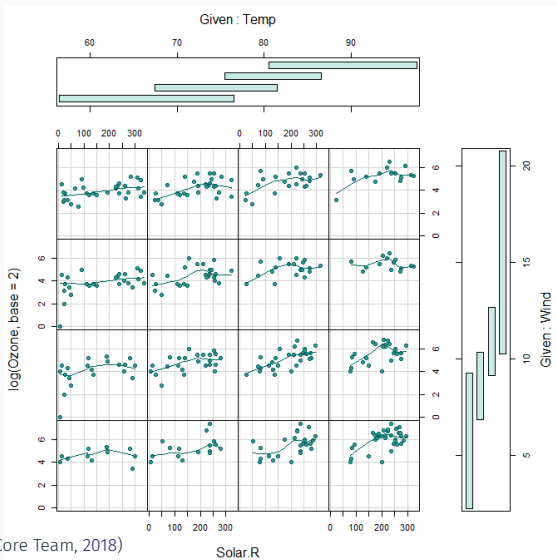
Residential P.M.   Ambient P.M.   Lead   Ambient Ozone   Residential Radon

Mortality Rate per One Million

Year (2000's)

Image source (Ryan, 2019)

Source: OECD
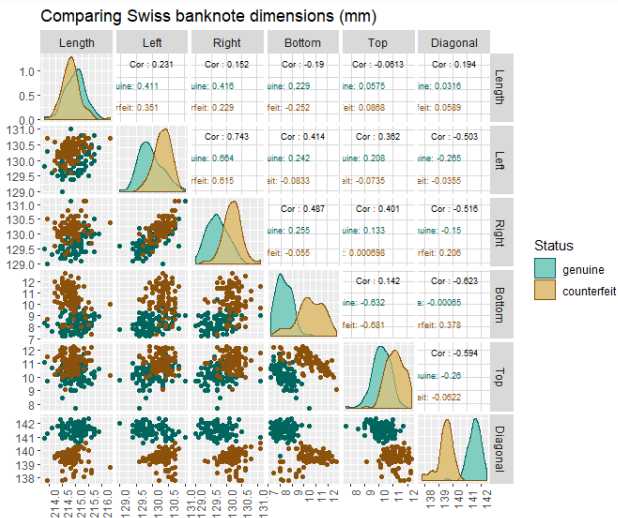
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Quantitative: Ozone, temperature, wind speed, solar radiation

Scatterplot matrix

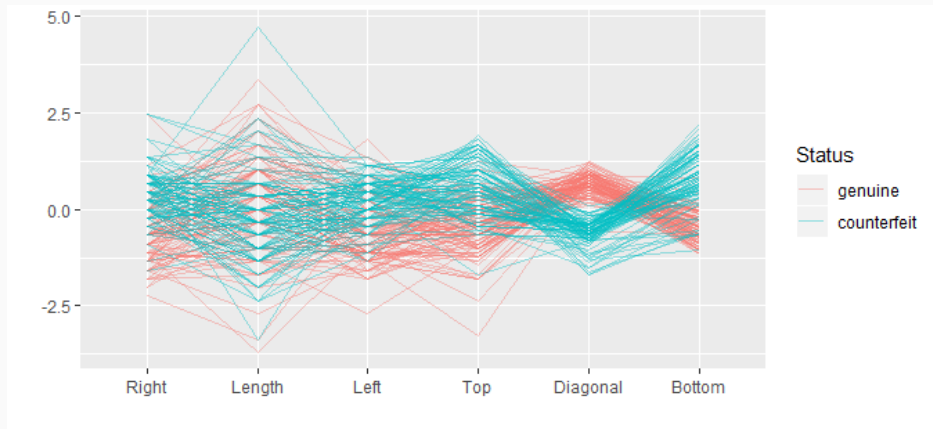Quantitative: Six dimensions of Swiss banknotes

Comparing Swiss banknote dimensions (mm)

Data source (Hurley, 2019)

Parallel coordinate plot

Quantitative: Six dimensions of Swiss banknotes

Data source (Hurley, 2019)

Cycle plot or month plot

Quantitative: Number of wildlife strikes on aircraft

Categorical: Month, year

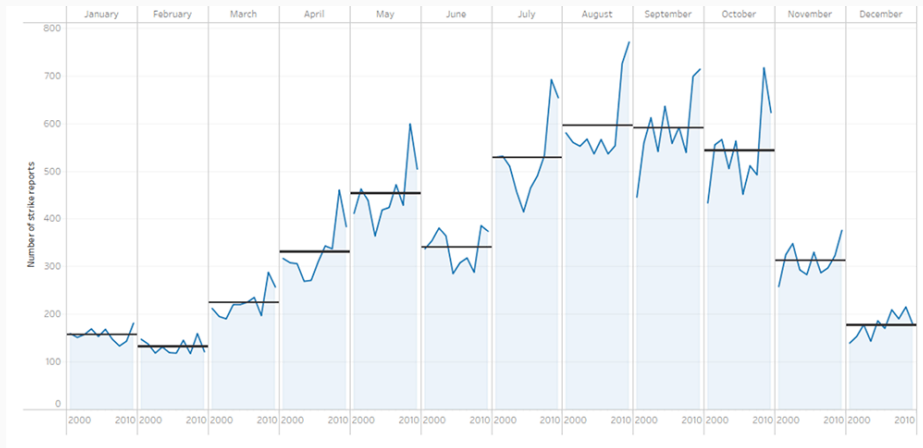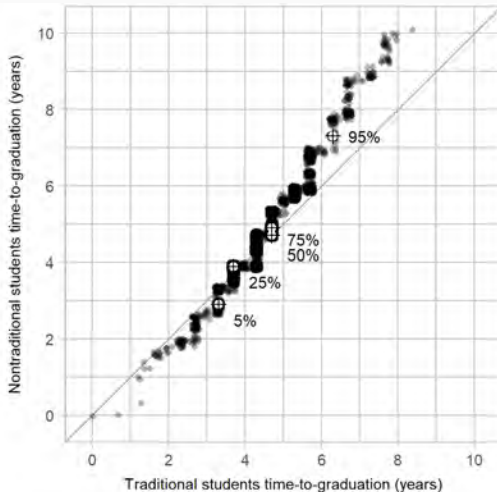Image source https://canonicalized.com/cycle-plots-tableau/

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Quantile-quantile plot or q-q plot

Quantitative: Years to graduate quantiles

Categorical: Traditional students, nontraditional students

Sankey diagram

Quantitative: Numbers of students

Categorical: Starting major, destination major

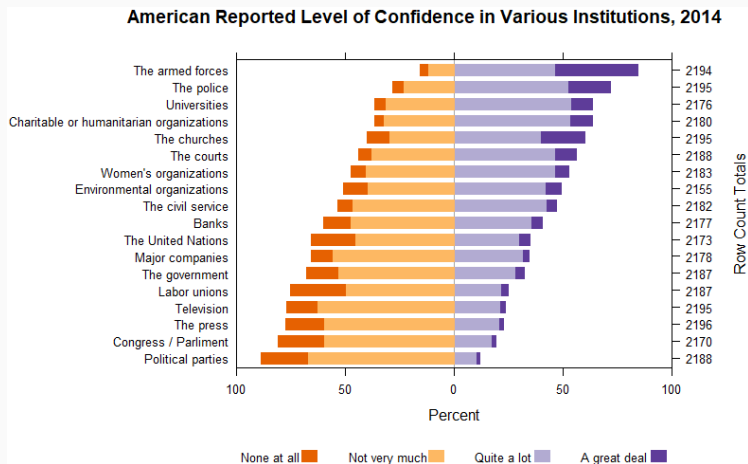Women ever enrolled in Industrial Engineering

Data source (MIDFIELD, 2019)

Diverging stacked bar chart

Quantitative: Frequency of response, count totals

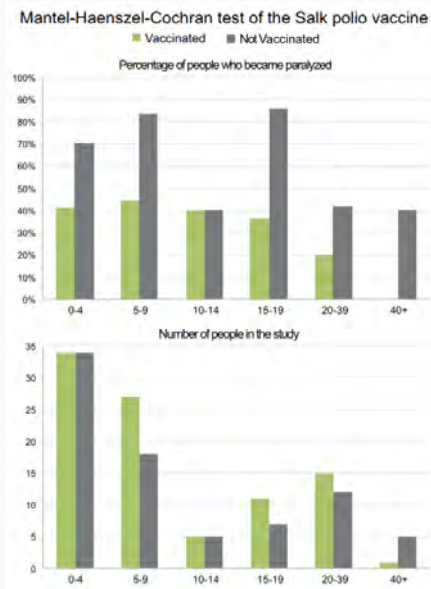Categorical: Survey questions, level of confidence

American Reported Level of Confidence in Various Institutions, 2014

Image source (Ryan, 2019)

Multivariate bar chart

Quantitative

- number of people
- percent became paralyzed

Categorical

- age group
- vaccination status

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Linked micromaps
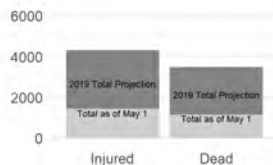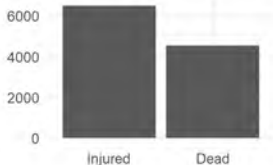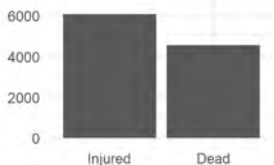

Image source (Harrelson, 2019)
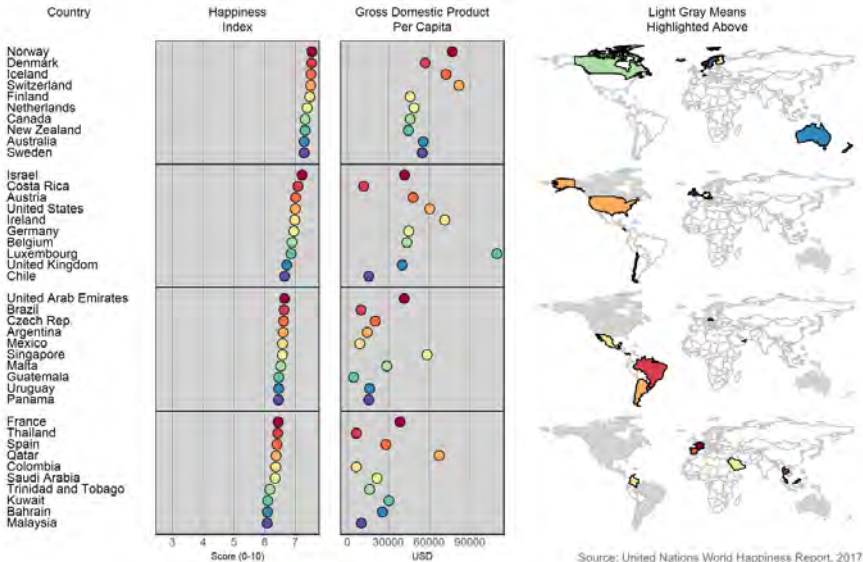
Proportional symbol map

Attacks claimed by the Islamic State and Boko Haram, 2017-2019
Point size is proportional to the number of deaths and injuries in each attack.
ISIS in green, Boko Haram in blue.
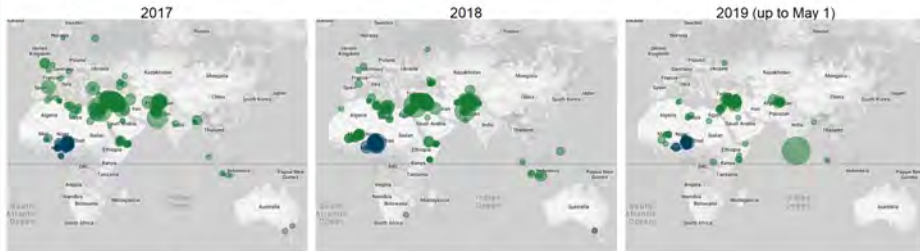
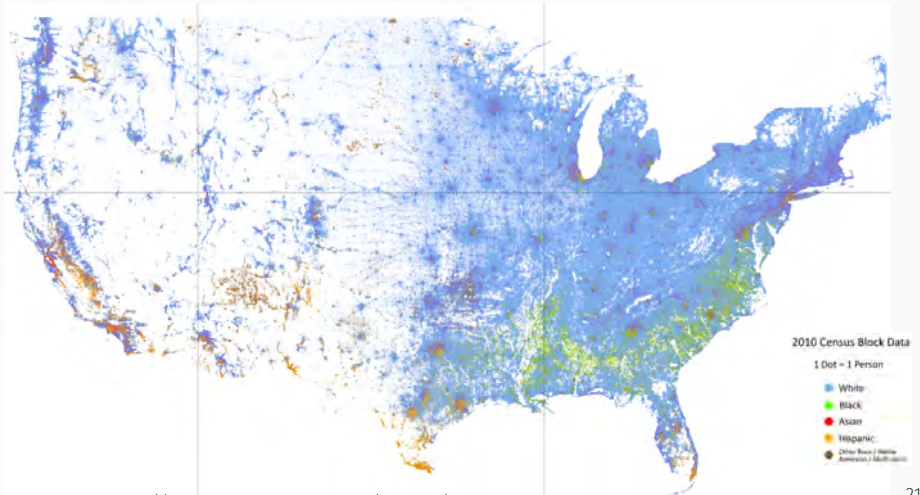Source: Wikipedia, List of terrorist incidents

Dot density map

Quantitative: Latitude, longitude

Categorical: Race/ethnicity

2010 Census Block Data

1 Dot = 1 Person

- White
- Black
- Asian
- Hispanic
- Other Race / Native American / Multiracial
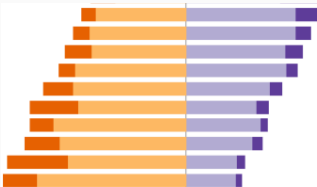
In summary, three precepts guide one's choice of graph type

Data structure determines which graph types are feasible

Graphical repertoire determines which graph types you explore

Design choices align your visual argument with your rhetorical goals

References

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https://CRAN.R-project.org/package=gclus

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Statistical Computing, Vienna, Austria https://www.R-project.org

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https://CRAN.R-project.org/package=GDAdata