

lecture 13: visualizing uncertainty

November 6, 2017



▶ ⏪ 🔊 10:29 / 22:58



Do you know Nothing when you see it – Amelia McNamara



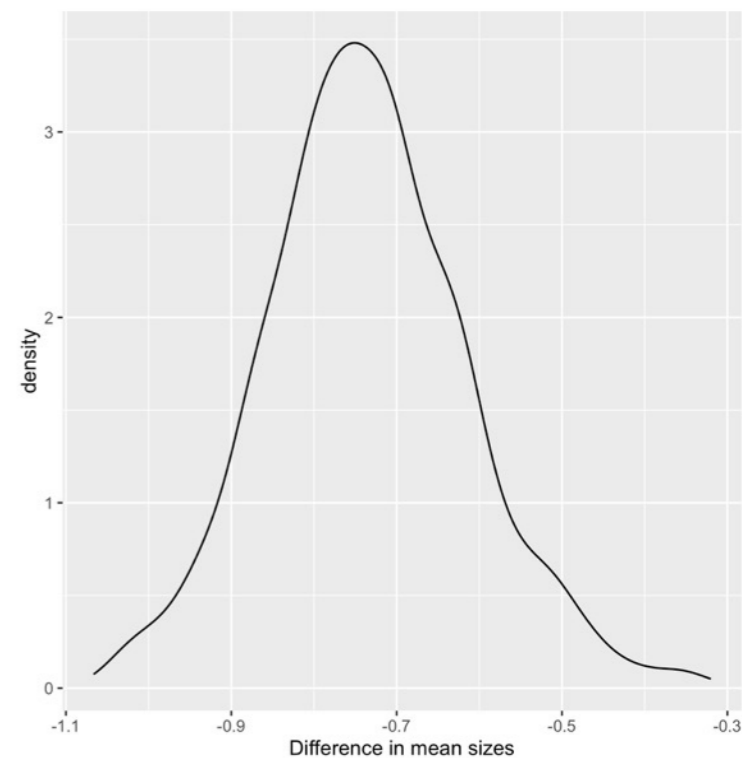
Bocoup LLC

 **Subscribe** 3,279

279 views

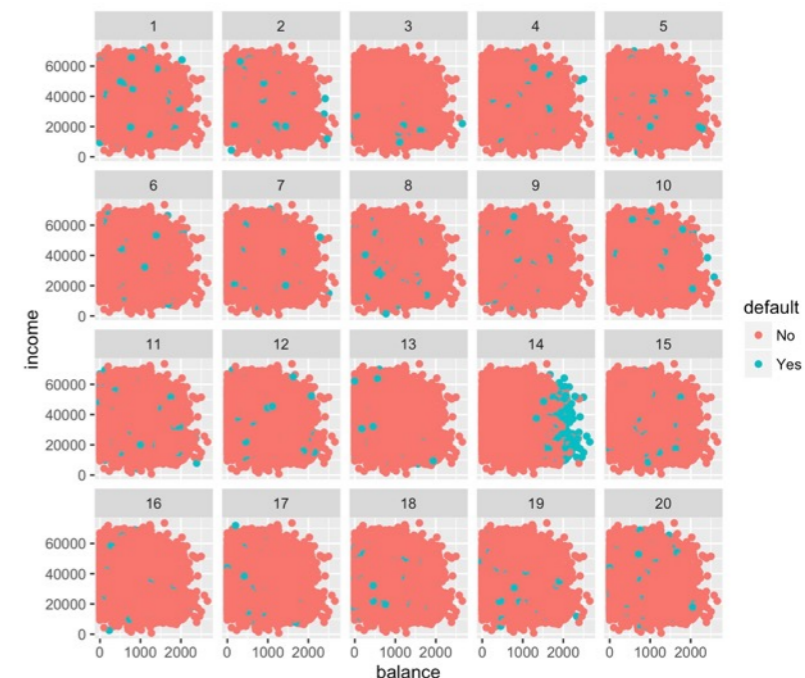
Statistics seeks to answer general questions:

- Is this number different than zero?
- How sure am I about this number?



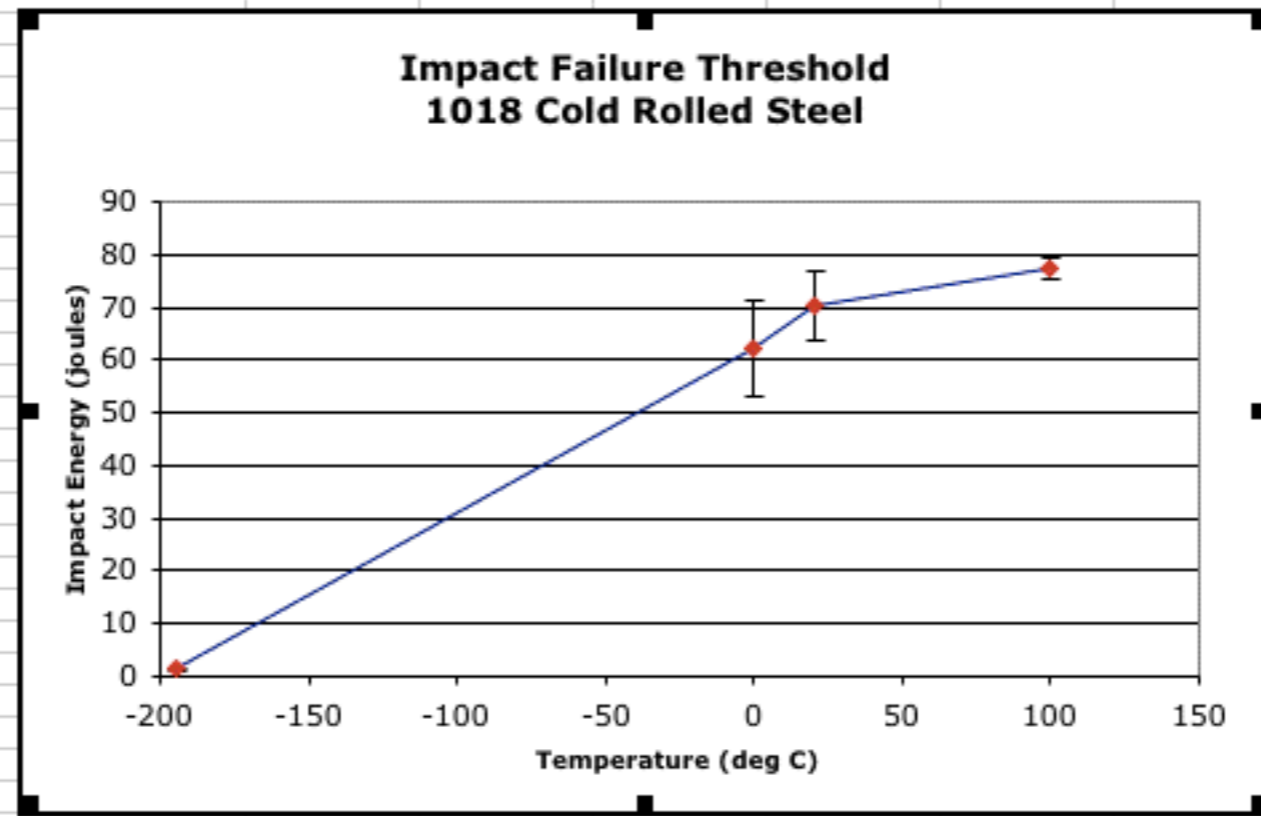
Similar questions in visualization:

- Is this visualization different than “nothing”?
- How sure am I about the story I see?



A static solution

	Temperature (C)			
	-195	0	20	100
Impact Energy (joules)	1	52	48	74
	2	82	74	72
Mean	1.4	62.2	70.4	77.4
	0.5	20.8	14.4	4.2
Standard Deviation	0.2	9.3	6.5	1.9



1.5.1.1 1D

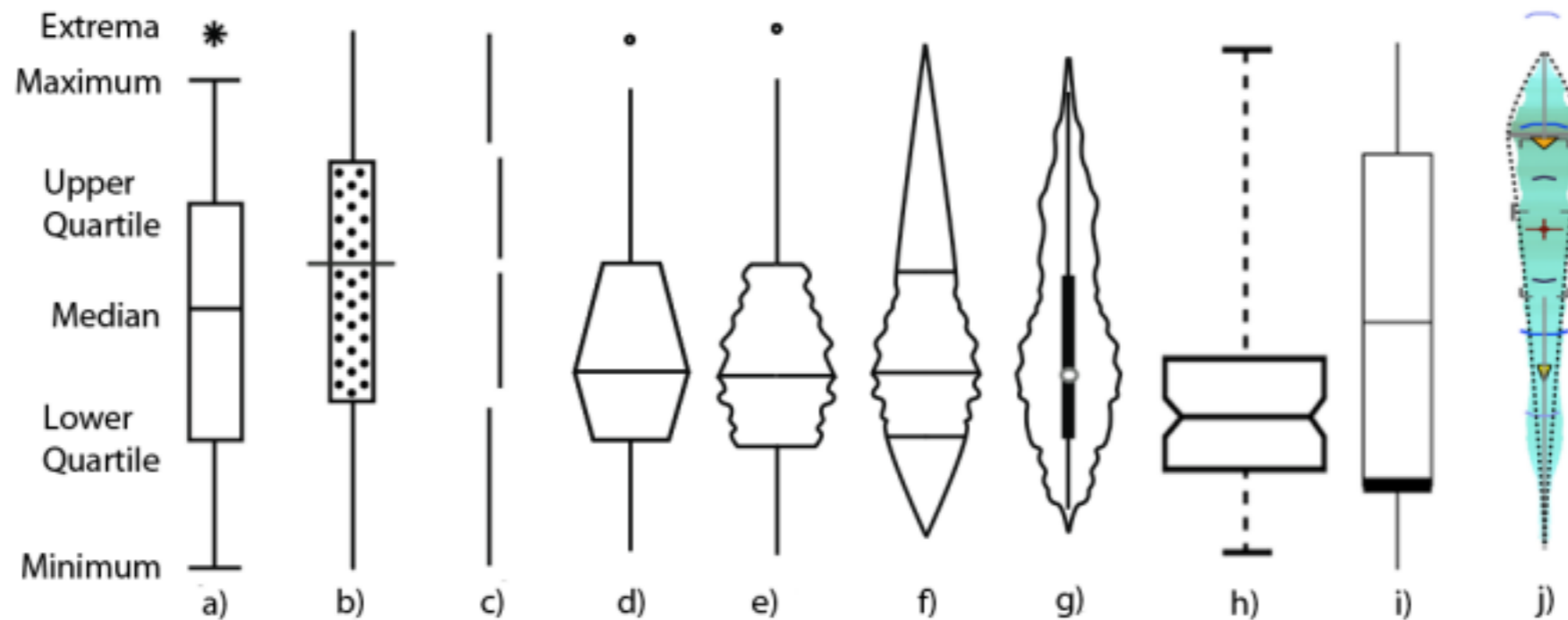
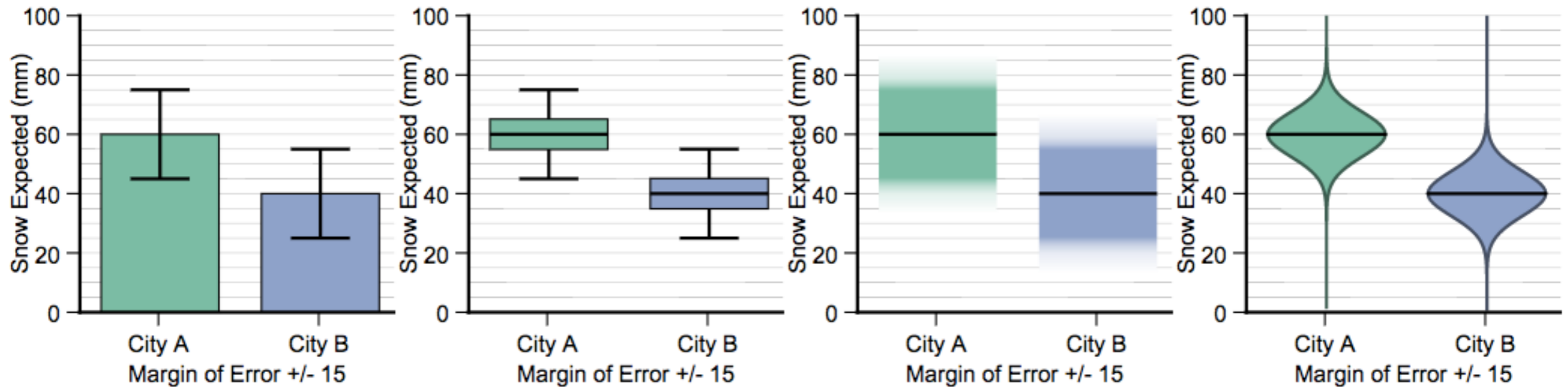


Fig. 1.2 Variations of the boxplot. a) The construction of the boxplot [106] b) Range plot [97] c) Innerquartile plot [105] d) Histplot [4] e) Vaseplot [4] f) Box-percentile plot [26] g) Violin plot [40] h) Variable width notched boxplot [68] i) Skewplot [16] j) Summary plot [85]

But...

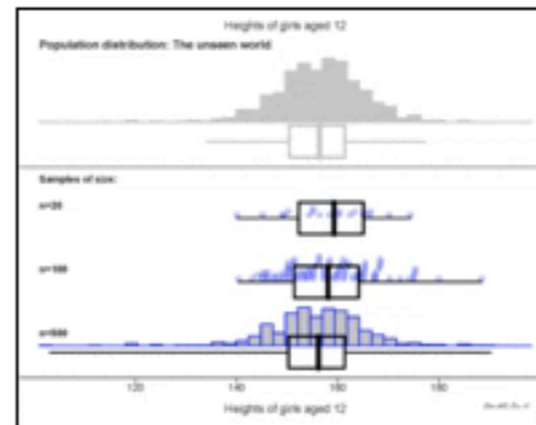
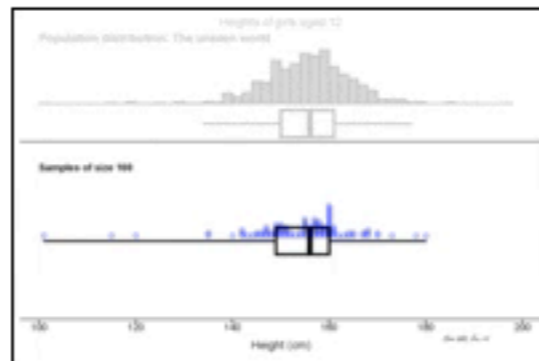


Michael Correll, Michael Gleicher. (2014). Error Bars Considered Harmful: Exploring Alternate Encodings for Mean and Error. *IEEE Transactions on Visualization and Computer Graphics*, 20(12). <http://bit.ly/ErrorBars>

Making the Call

Chris Wild, Nick Horton, Maxine Pfannkuch, Matt Regan

One Population



Animated Gifs

Click for: [n=30](#) [n=100](#) [n=300](#)

[View Full Size GIF](#)

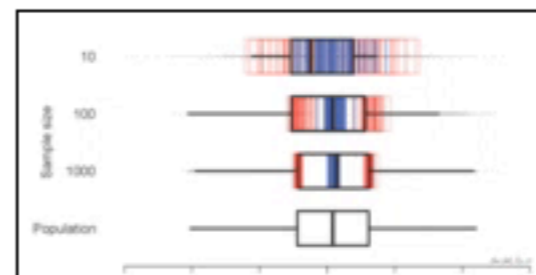
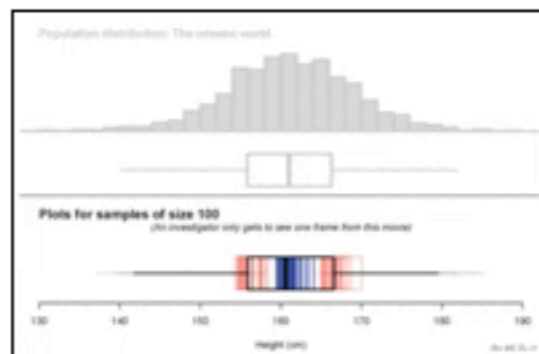
PDFs

Click for: [n=30](#) [n=100](#) [n=300](#)

[View Full size PDF](#)

1(a)

1(b)



Animated Gifs

Click for: [n=30](#) [n=100](#) [n=300](#)

[View full size GIF](#)

PDFs

Click for: [n=30](#) [n=100](#) [n=300](#)

[View full size PDF](#)

2(a)

2(b)



SAD: the folk music of uncertainty vis




12:59 / 30:59

⏪ ⏩ 🔊

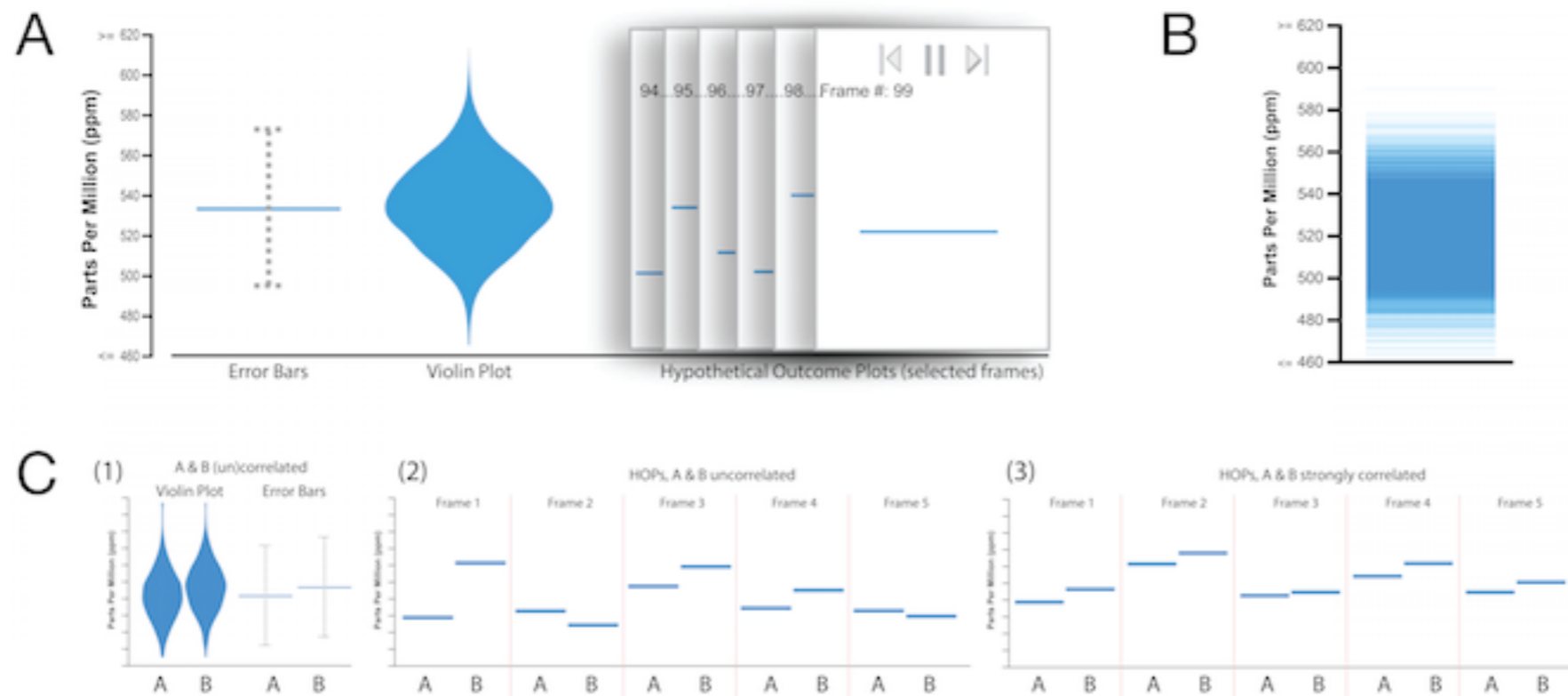
CC ⚙️ 📺

The Visual Uncertainty Experience - Jessica Hullman

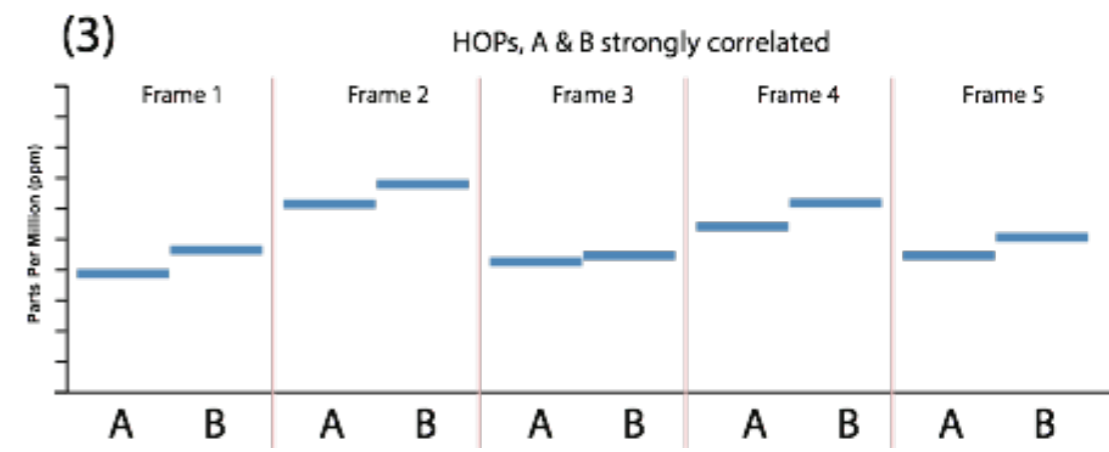
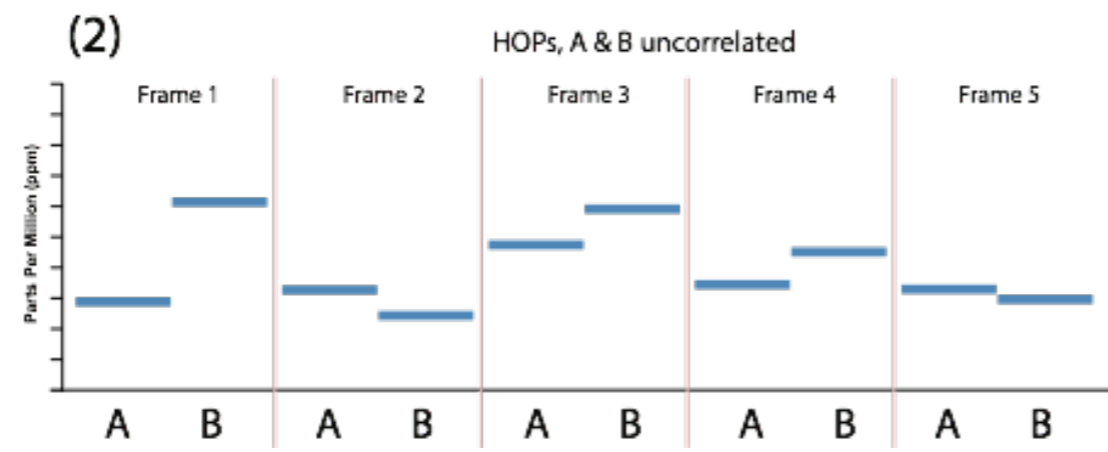
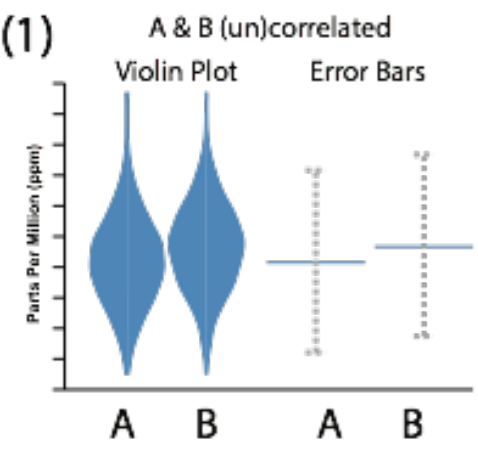
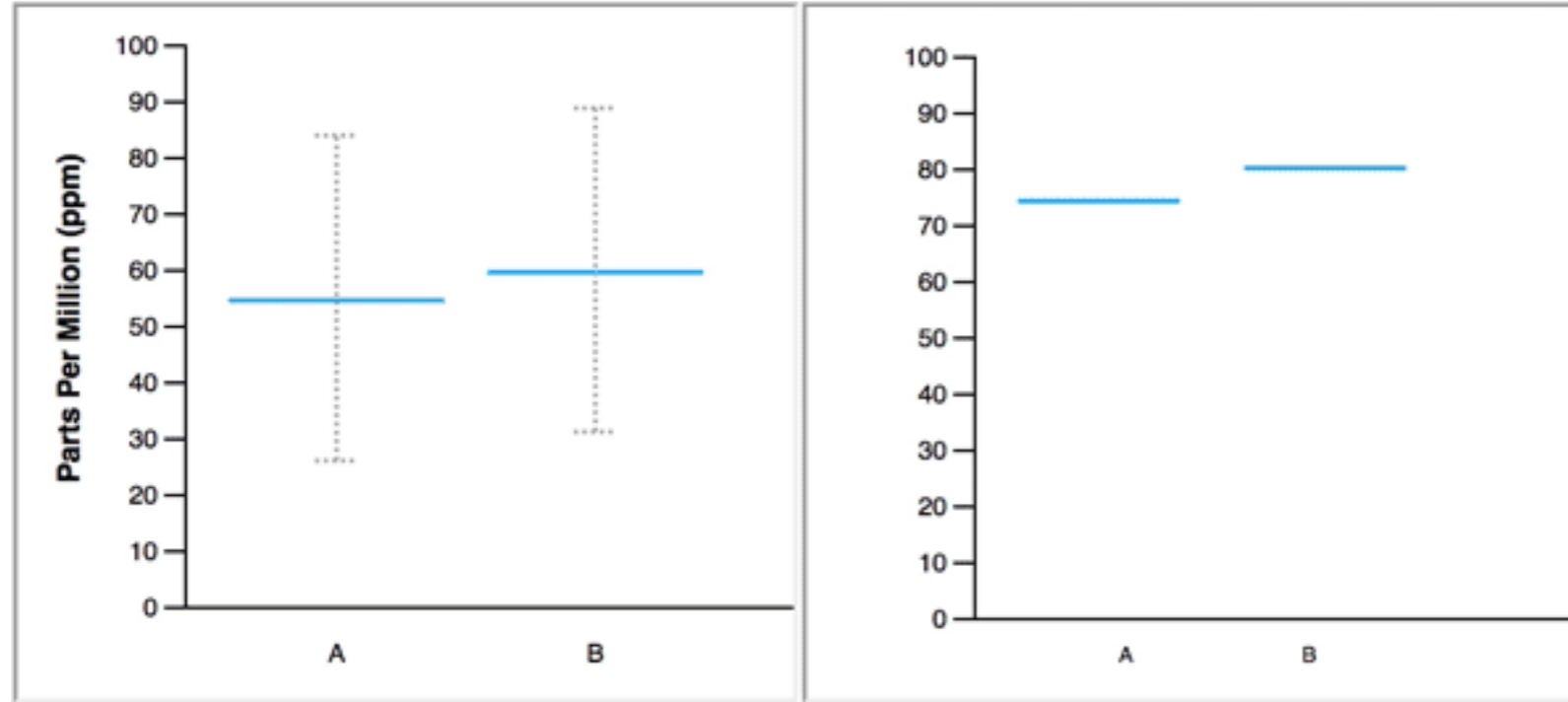
 Bocoup LLC

[Subscribe](#) 3,279

317 views



Jessica Hullman, Paul Resnick, Eytan Adar. (2015).
 Hypothetical Outcome Plots Outperform Error Bars and Violin
 Plots for Inferences About Reliability of Variable Ordering.
PLOS ONE, 10(11). <http://bit.ly/HypotheticalOutcomePlots>



1.5.1.2 2D

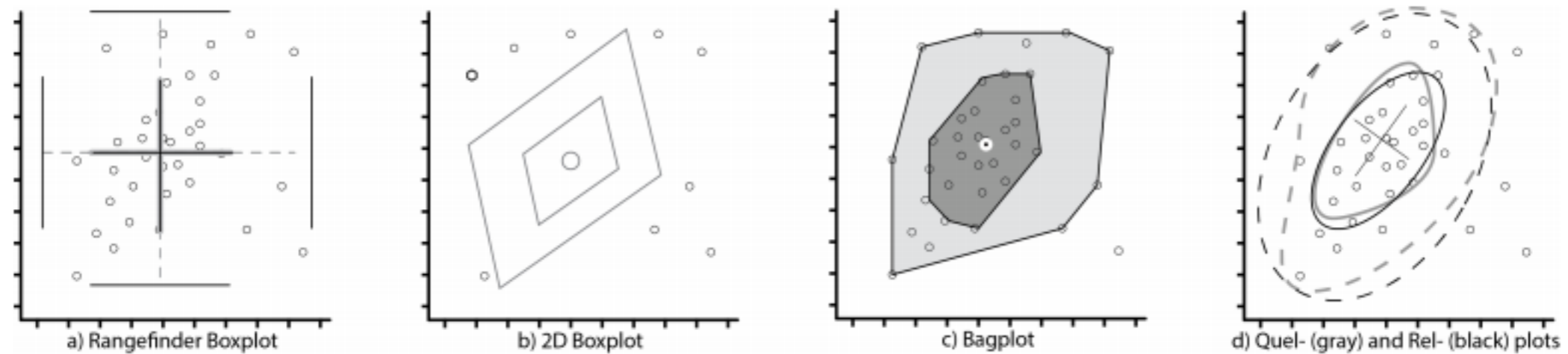
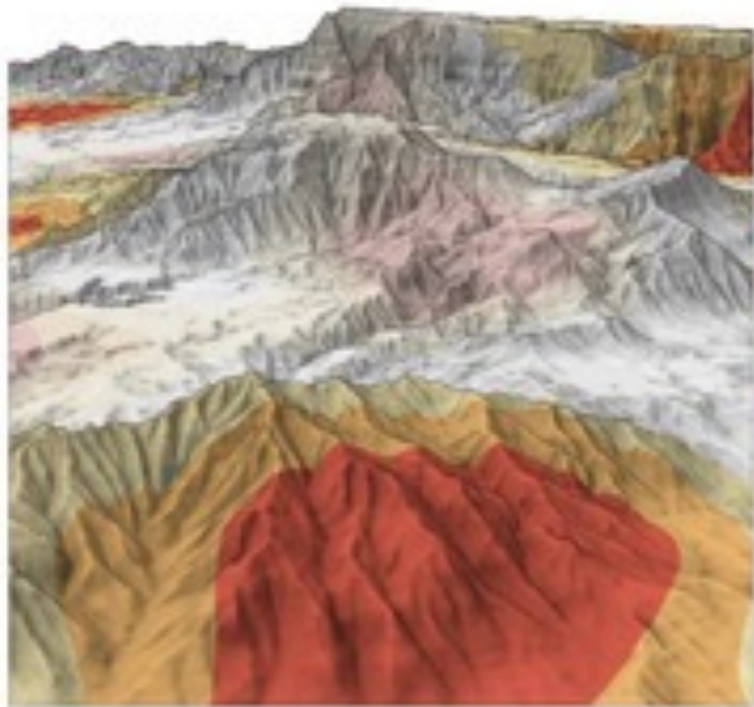


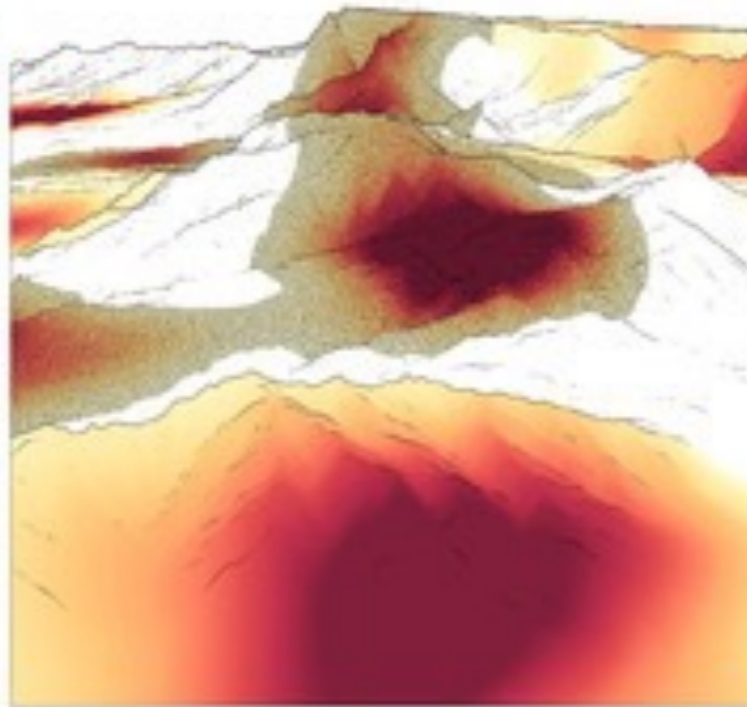
Fig. 1.3 Bivariate extensions of the boxplot. (a) The rangefinder boxplot [3]. (b) The 2D boxplot [102]. (c) The bagplot [91]. (d) The quel- and relplots [33]

Standard implementations of the boxplot focus on univariate data distributions. The five-number summary is a useful descriptor of not only univariate, but also

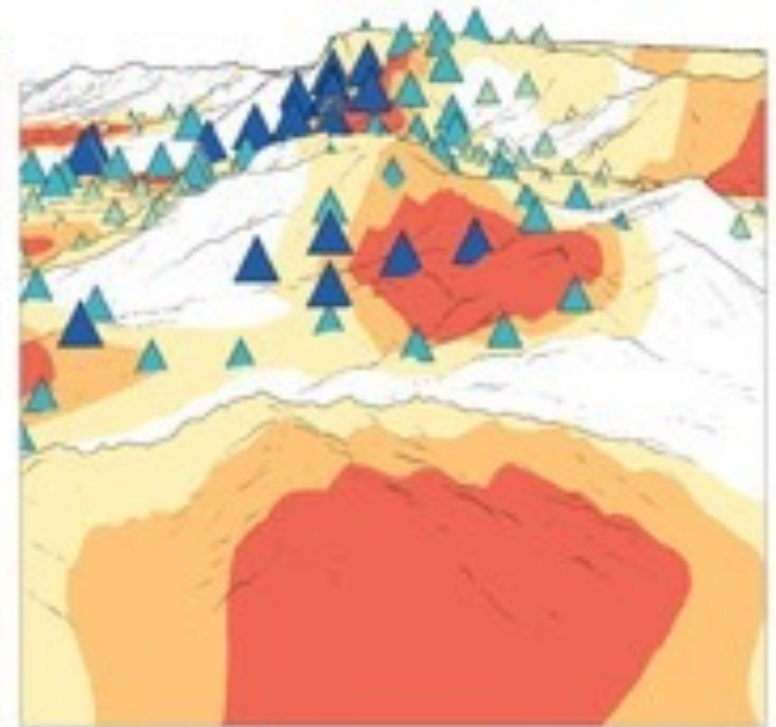
Spatial uncertainty



(a) Prioritizing terrain



(b) Prioritizing data



(c) Prioritizing uncertainty

Let's let Amanda Cox tell us what to do

