

Hands-on session: Python

Research Data Visualisation Workshop



The James
Hutton
Institute

Leighton Pritchard^{1,2,3}

¹Information and Computational Sciences,

²Centre for Human and Animal Pathogens in the Environment,

³Dundee Effector Consortium,

The James Hutton Institute, Invergowrie, Dundee, Scotland, DD2 5DA



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1 Introduction

- Elementary perceptual tasks

2 Evidence-based representation

- What representations work best?
- To piechart or not to piechart?

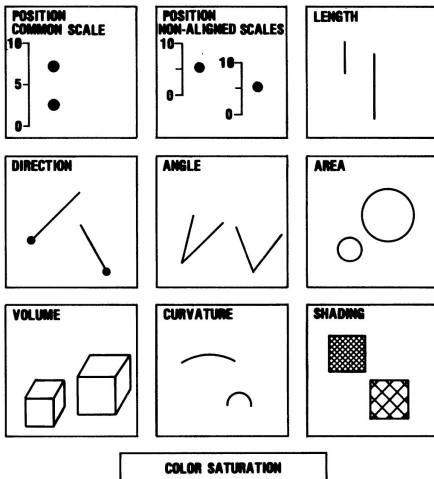
3 Acknowledgements



Elementary Perceptual Tasks ^a

^aCleveland & McGill (1984) *J. Am. Stat. Ass.*

The most basic visual tasks:

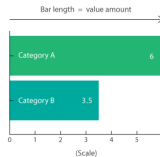




Implementations

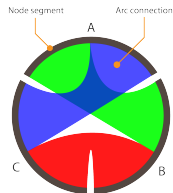
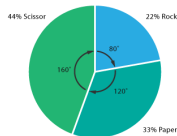
Position: common scale

- Scatterplot
- Bar Chart



Angle

- Pie Chart
- Do(ugh)nut Chart



Curvature

- Arc Diagram
- Chord Diagram



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What works best? Experiment ^a ^b

^aCleveland & McGill (1984) *J. Am. Stat. Ass.*

^bHeer & Bostock (2010) *CHI 2010*

Empirical measurements of interpretation

- Subjects shown graphs representing same data
- (\log_2) Error in subjects' accuracy compared by graph type

Judgement types

- 1-3: Position on a common scale (bar chart, stacked bar chart)
- 4-5: Length encoding (stacked bar chart)
- 6: Angle (pie chart)
- 7-9: Area (bubble chart, aligned rectangles, treemap)



What works best? Result ^a ^b

^aCleveland & McGill (1984) *J. Am. Stat. Ass.*

^bHeer & Bostock (2010) *CHI 2010*

- We have inherent biases that can distort information recovered
- Position > Angle \approx Length > Area
- Accuracy plateaus as charts increase in size
- Gridlines improve accuracy
- Aspect ratios affect area judgements (squares worst)

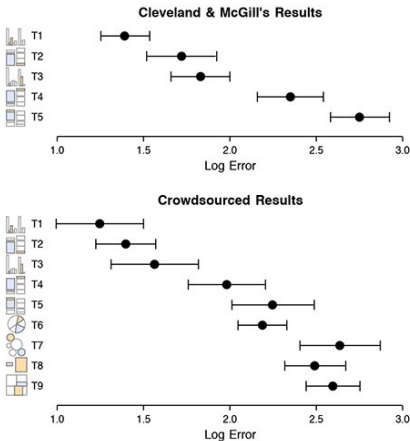


Figure 4: Proportional judgment results (Exp. 1A & B). Top: Cleveland & McGill's [7] lab study. Bottom: MTurk studies. Error bars indicate 95% confidence intervals.



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