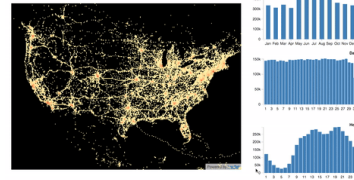
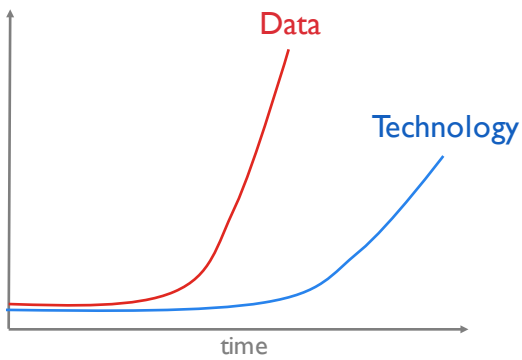


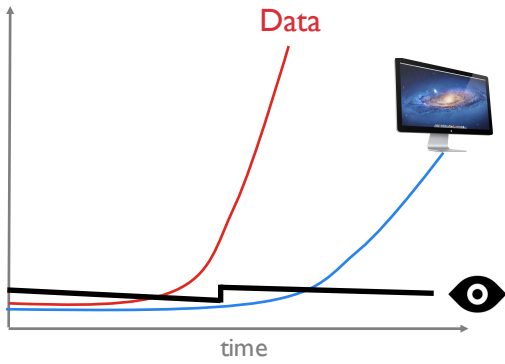
regulate... pfunk error

Daniel Alabi, Eugene Wu



Interactive Visualization Fast & Accurate





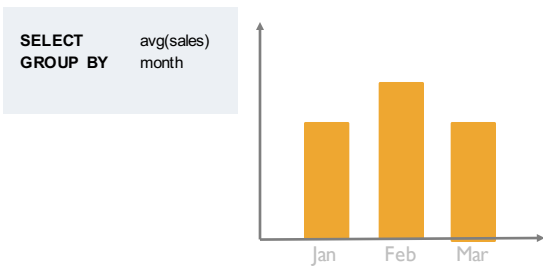
Millennials (Born 1981-1996):

- Nearly four in 10 millennials spend at least nine hours on digital devices each day (37.4 percent)
- Nearly seven in 10 (68 percent) report symptoms of digital eye strain

Inaccurate

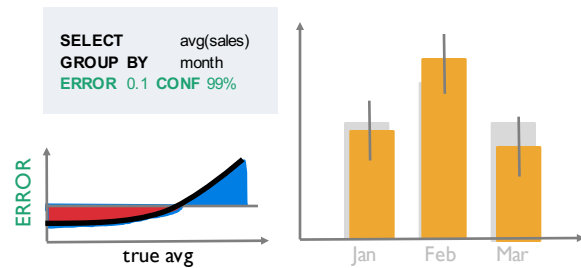
but perceptually accurate

Naïve Approach



7

Naïve Approach



8 Wrong Wasted Work

Context Dependent



How to express?

9

$$P(\text{true values} \mid \text{context}) = \epsilon$$

- $P(80 \mid \text{barchart, height}) = \pm 5$
- $P(30 \mid \text{barchart, height}) = \pm 2$
- $P(80 \mid \text{barchart, color, JET}) = \pm 30$

- $P(\text{val} \mid \text{chart type, ...})$
- $P(\text{val} \mid \text{judgment task, ...})$
- $P(\text{val} \mid \text{fatigue, ...})$

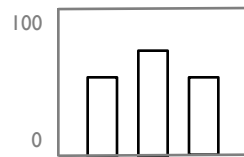
10

$$P(\text{true values} \mid \text{context}) = \epsilon$$

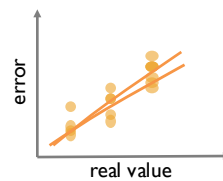
- $P(80 \mid \text{barchart, height}) = \pm 5$
- $P(30 \mid \text{barchart, height}) = \pm 2$
- $P(80 \mid \text{barchart, color, JET}) = \pm 30$

- $P(\text{val} \mid \text{chart type, ...})$
- $P(\text{val} \mid \text{judgment task, ...})$
- $P(\text{val} \mid \text{fatigue, ...})$

11

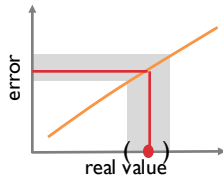


Estimate the height of the middle bar as a percentage of the total chart height.



12

est. value \in real value \pm P(real value)



13

HCI Community
Perceptual Studies

Perceptual Functions

Database Community
Optimizations

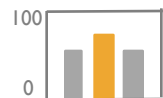
2 Direction

Extending perceptual functions

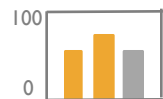
Data collection tools

15

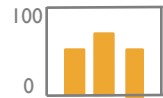
Univariate Height of middle bar



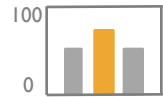
Bivariate Relative height of the two bars



N-variate Overall trend of the bars



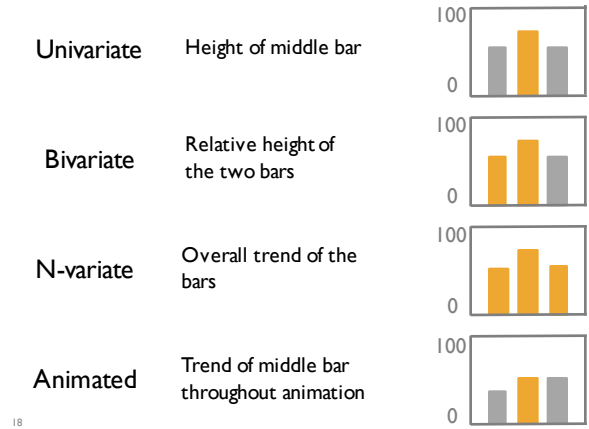
Animated Trend of middle bar throughout animation



16



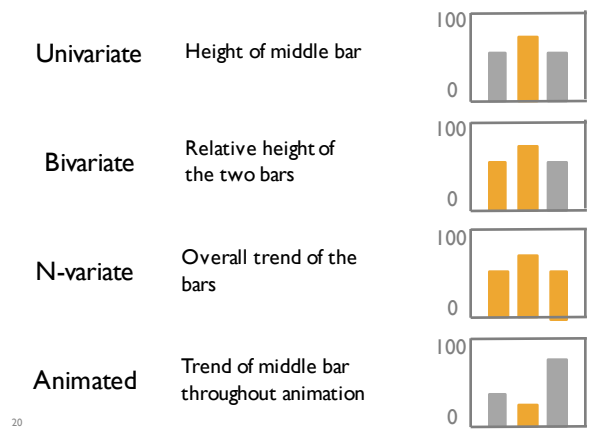
17



18



19



20

Univariate

Bivariate

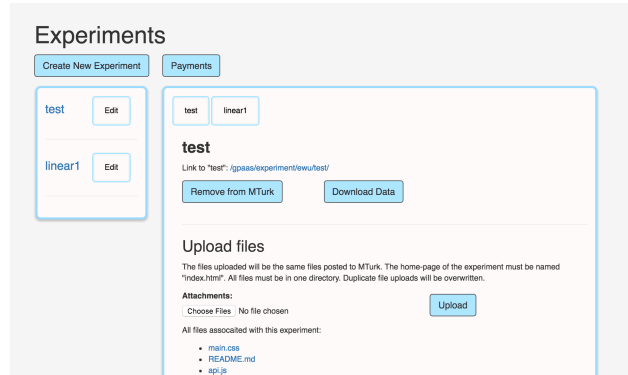
N-variate

Animated

Wins for each class of pfunks

21

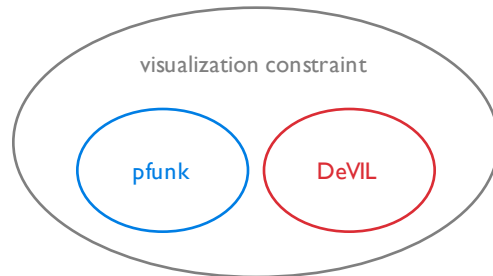
Graphical Perception as a Service



Open Questions

What judgment task?
 Are simple Contexts sufficient?
 More than for performance?

23



24



eugenewu.net

the pfunk era

