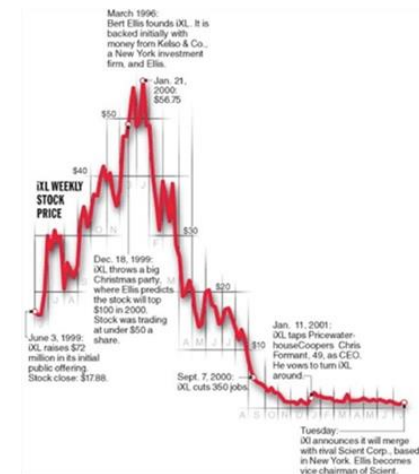
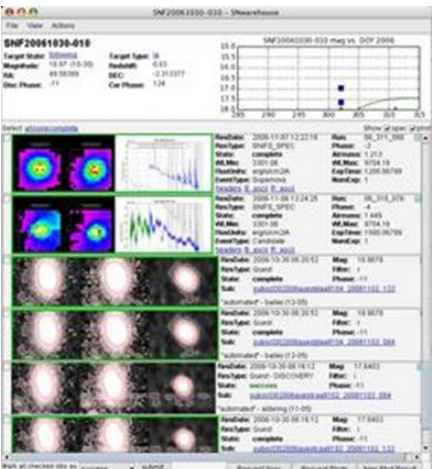


Visual Perception 3: Estimating Magnitude

Cecilia Aragon

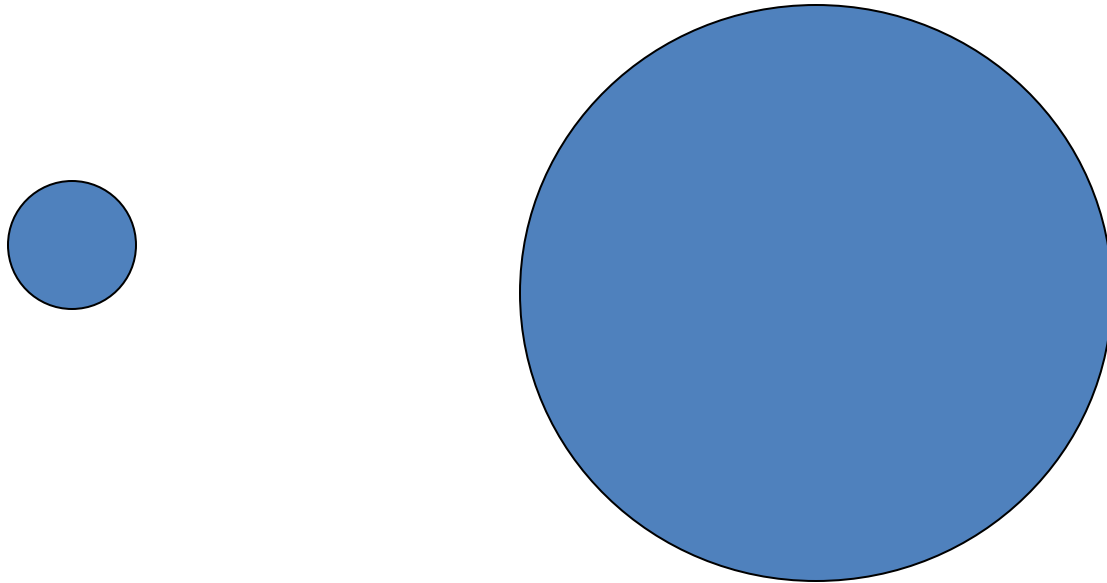
Associate Professor

Department of Human Centered Design & Engineering
University of Washington

[illegible]

Stevens' Power Law

- Compare area of circles:



Stevens' Power Law

Experimental results for perceptual estimation:

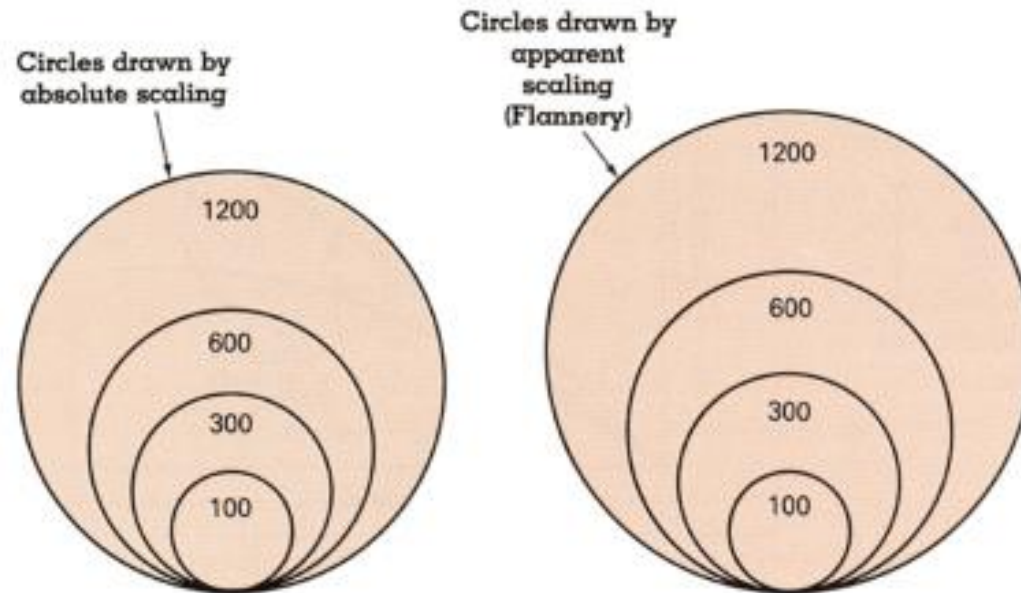
Length .9 to 1.1

Area .6 to .9 (underestimation)

Volume .5 to .8 (even more underestimation)

Stevens' Power Law

- Apparent magnitude scaling



[Cartography: Thematic Map Design, p. 170, Dent, 96]

$$S = 0.98A^{0.87}$$

[J. J. Flannery, The relative effectiveness of some graduated point symbols in the presentation of quantitative data, Canadian Geographer, 8(2), pp. 96-109, 1971] [slide from Pat Hanrahan]

Relative Magnitude Estimation

Most accurate



Least accurate

Position (common) scale

Position (non-aligned) scale

Length

Slope

Angle

Area

Volume

Color (hue/saturation/value)

Conclusion

- What is currently known about visual perception can aid the design process.
- Understanding low-level mechanisms of the visual processing system and using that knowledge can result in improved displays.