Science of Visualization - Handout

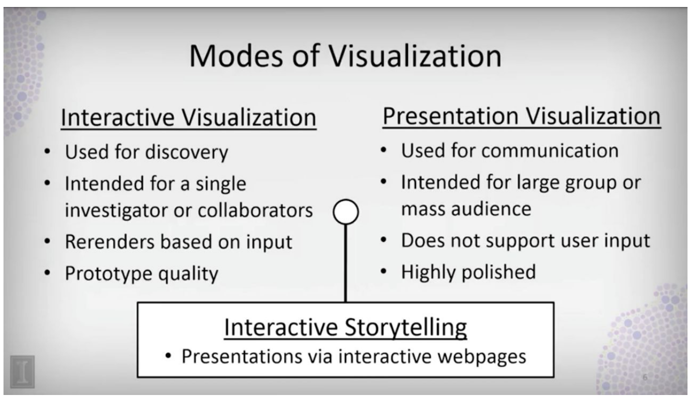
Overview of material from Data Visualization, a Coursera Course by John C. Hart from University of Illinois

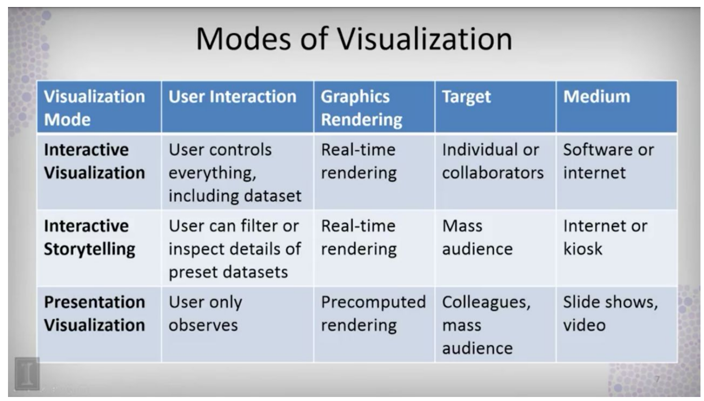
https://class.coursera.org/datavisualization-001

What is visualization

Data visualization is a **high bandwidth connection** between **data** on a computer system and a **human brain**, facilitated by visual communication.

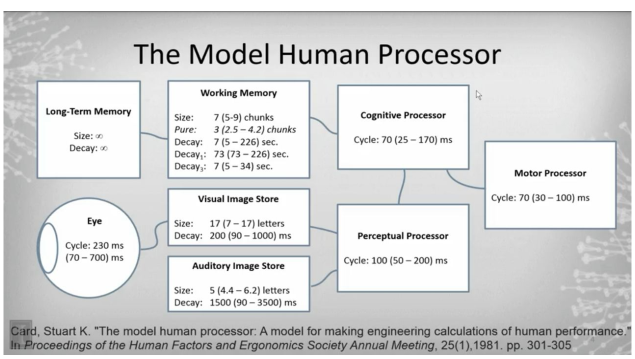
This includes: Data Acquisition, Data Processing, Data Display, Human Perception, Human Memory, and Human Cognition.

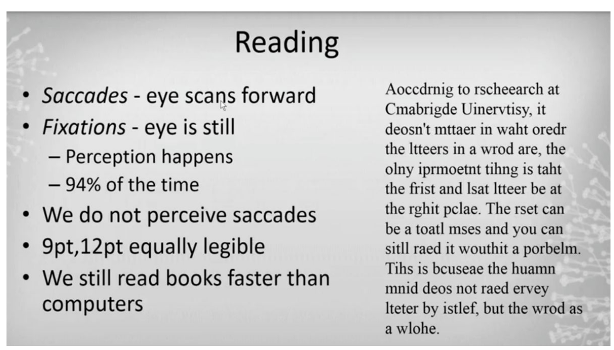


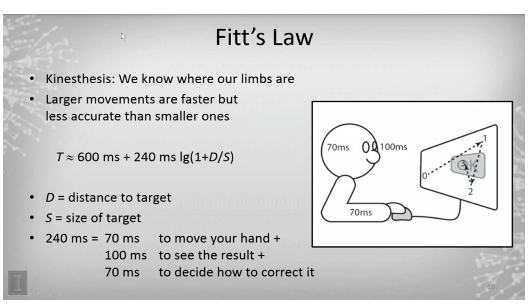

Modes of Visualization

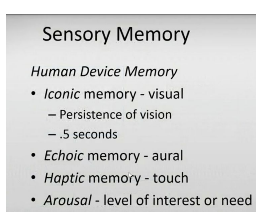
Visualization Mode	User Interaction	Graphics Rendering	Target	Medium
Interactive Visualization	User controls everything, including dataset	Real-time rendering	Individual or collaborators	Software or internet
Interactive Storytelling	User can filter or inspect details of preset datasets	Real-time rendering	Mass audience	Internet or kiosk
Presentation Visualization	User only observes	Precomputed rendering	Colleagues, mass audience	Slide shows, video

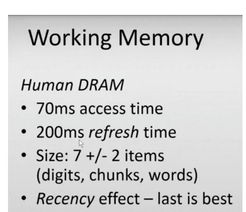
How the brain processes information / images:

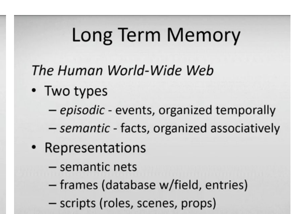












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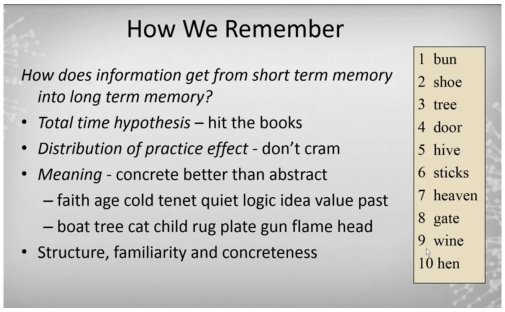
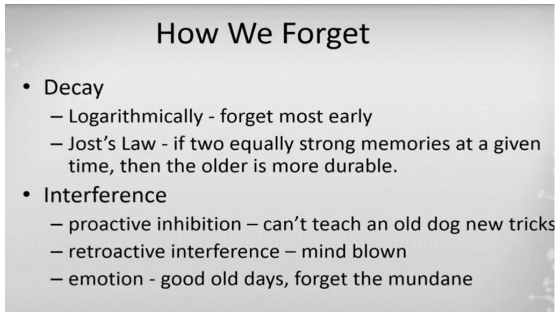
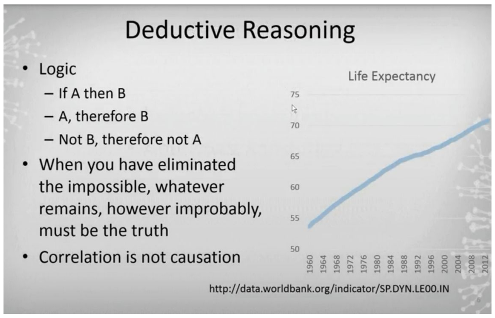
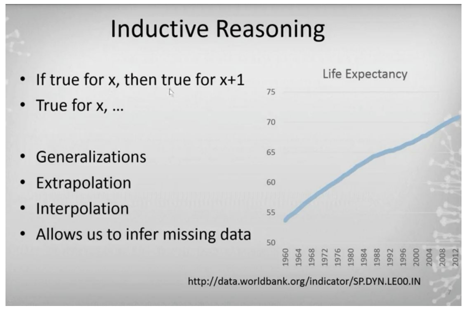
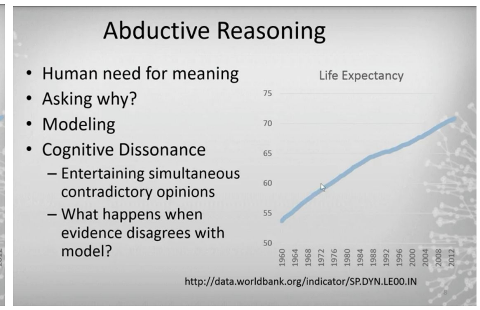


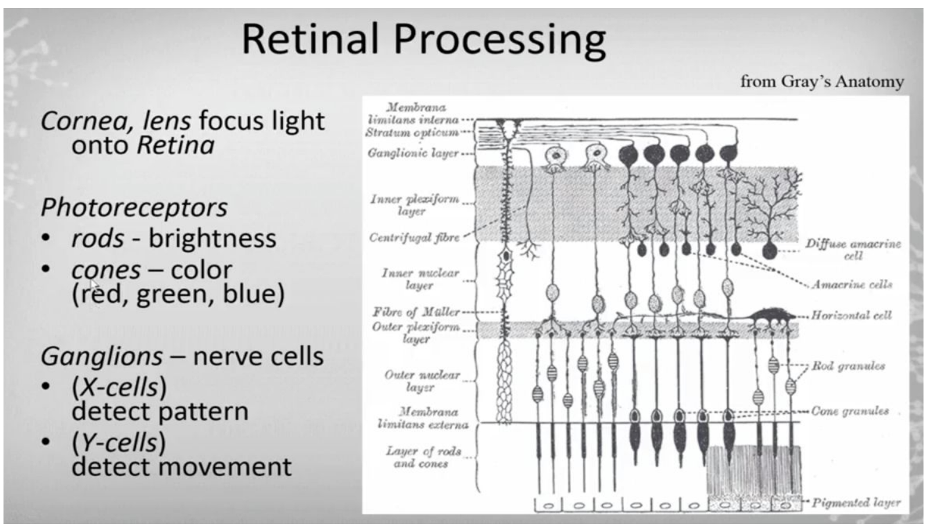






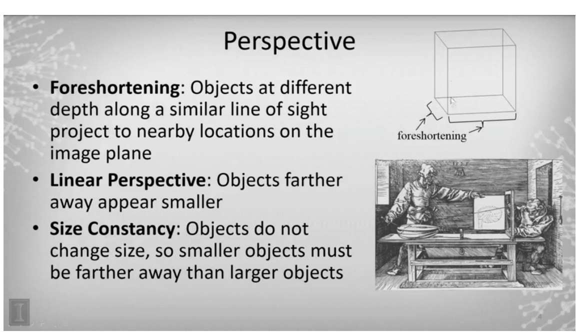


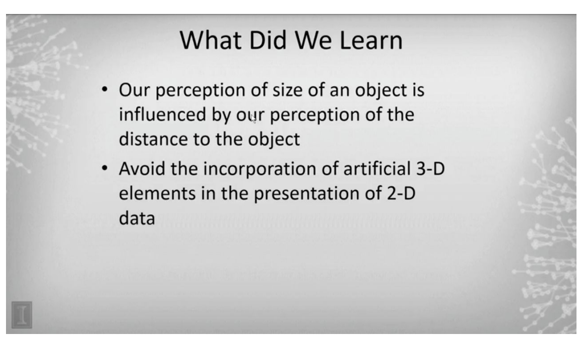
The Eye and Visual Perception



What challenges exist communicating visually

In neurobiology, lateral inhibition is the capacity of an excited neuron to reduce the activity of its neighbors. Lateral inhibition disables the spreading of action potentials from excited neurons to neighboring neurons in the lateral direction.





Actual Data Visualization

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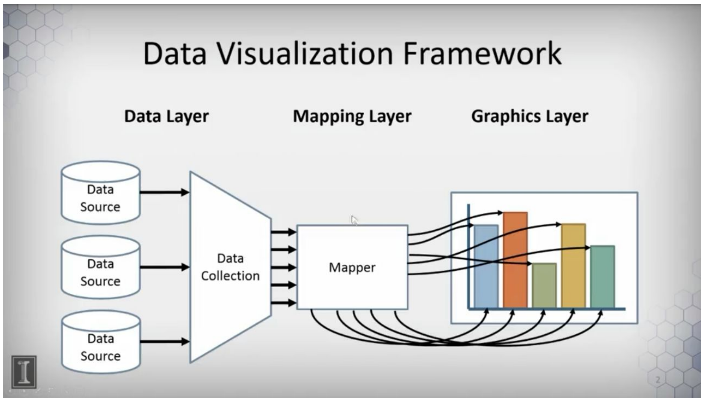

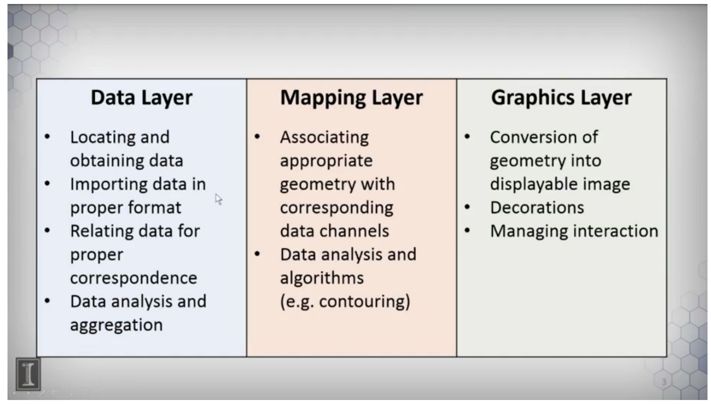

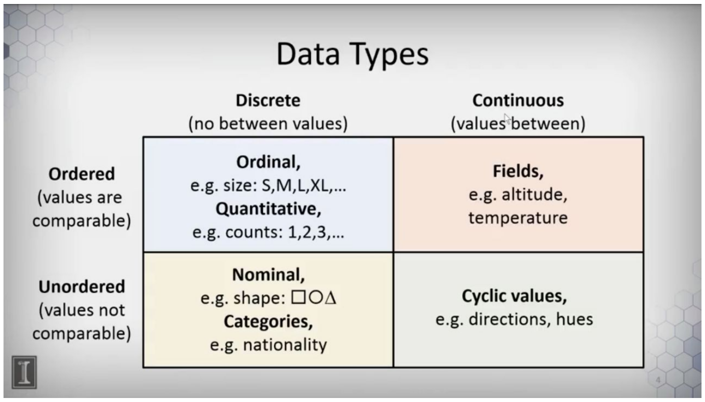

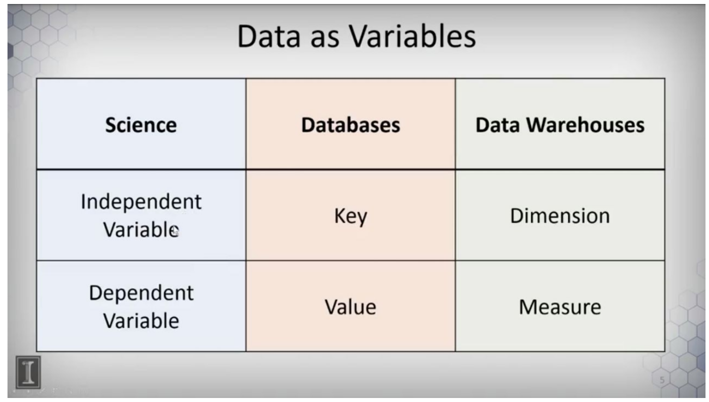

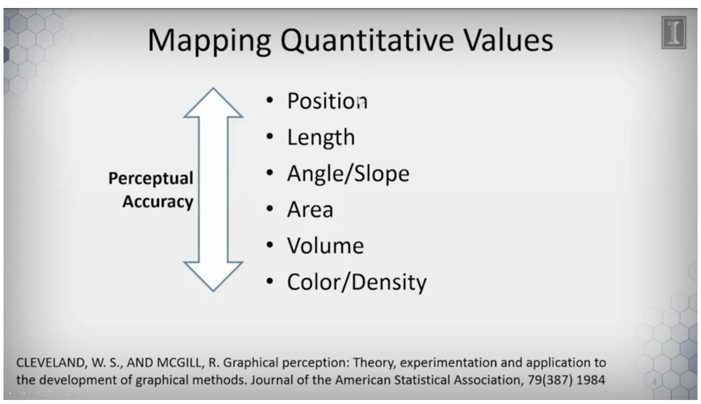

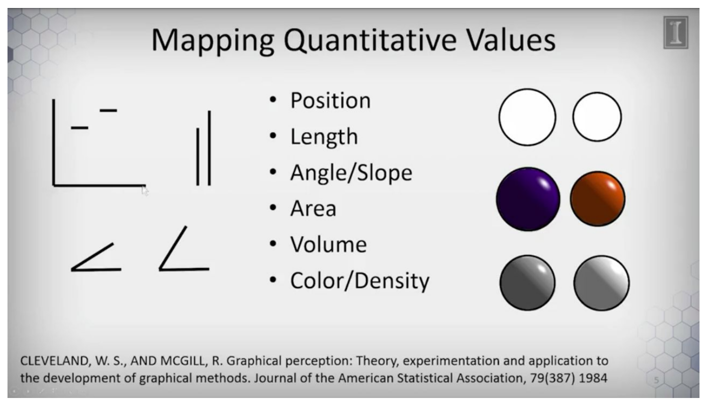

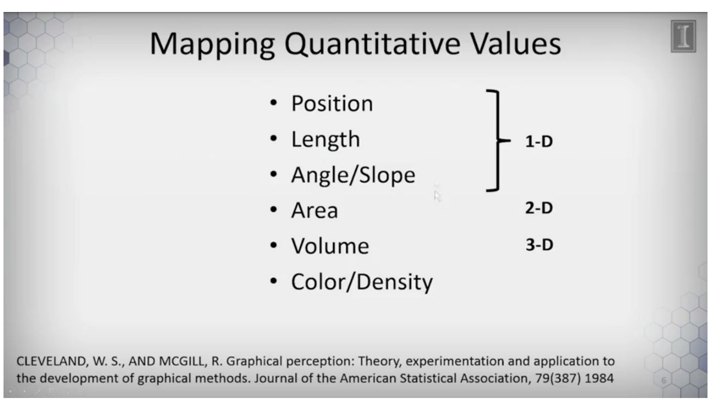

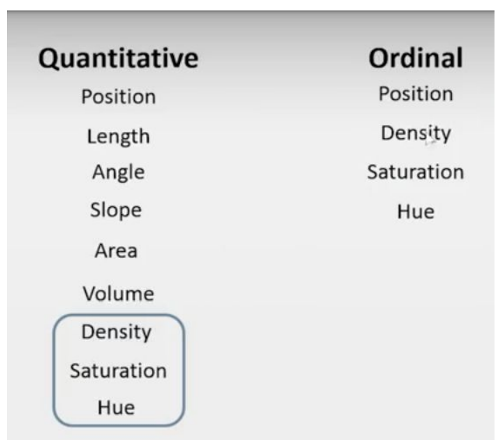

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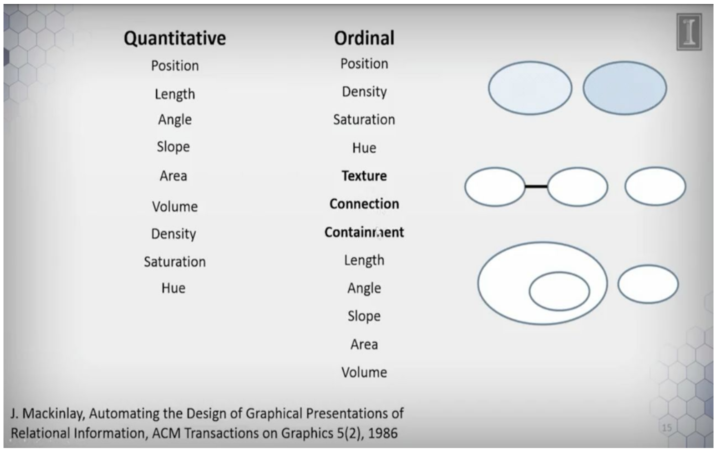

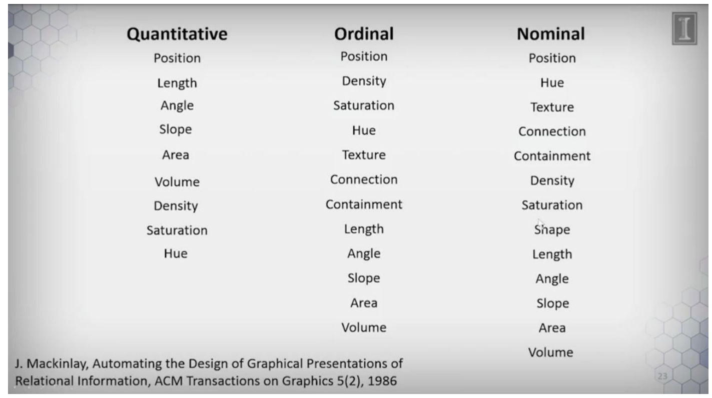

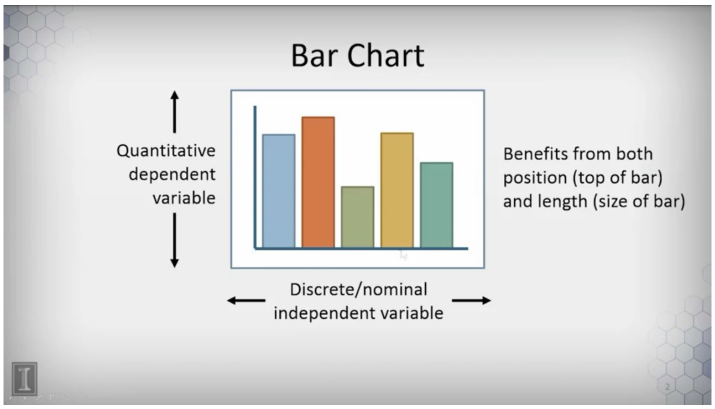

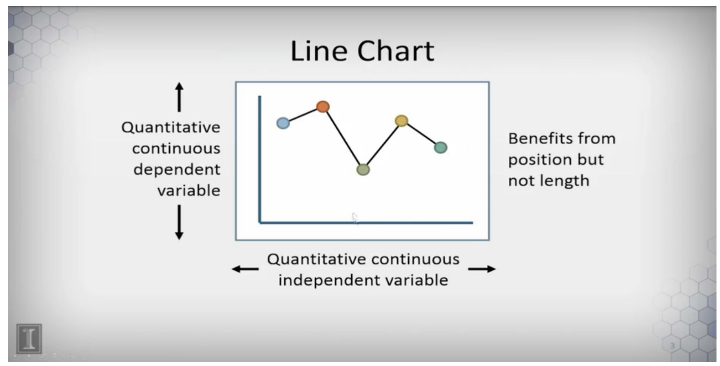

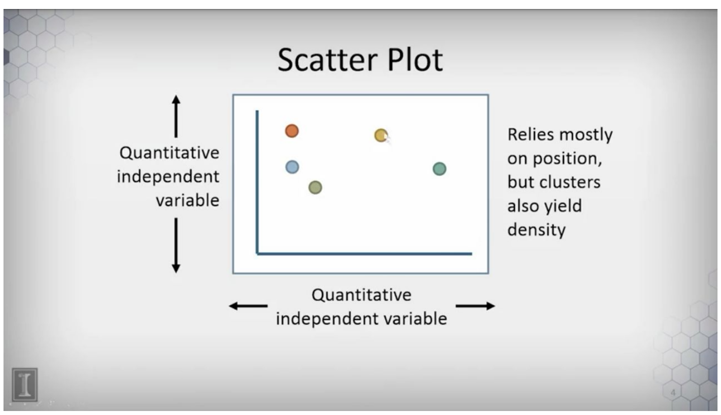

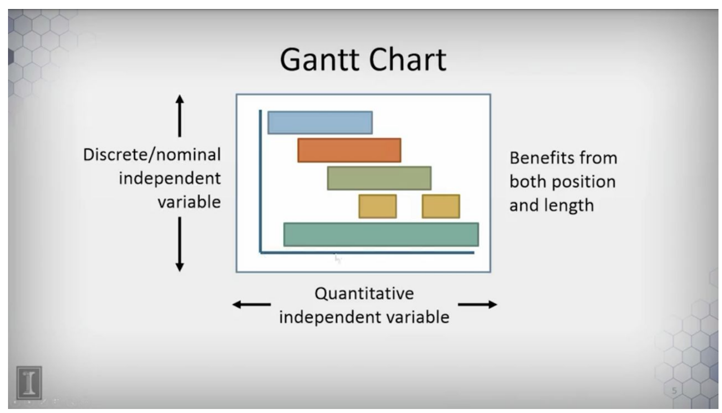

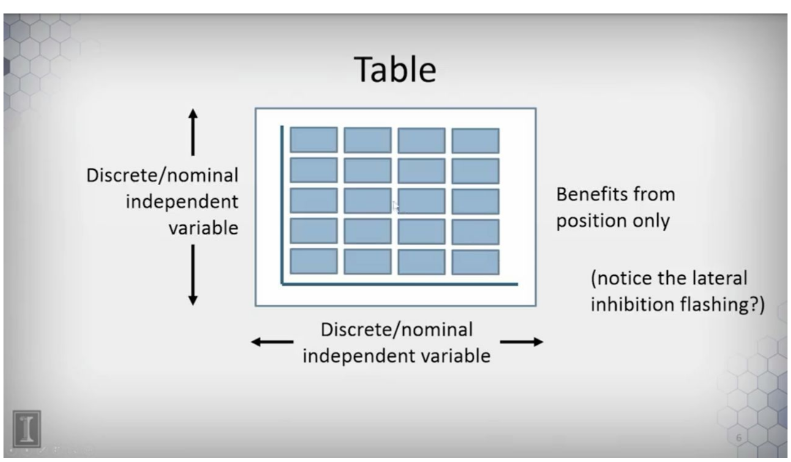

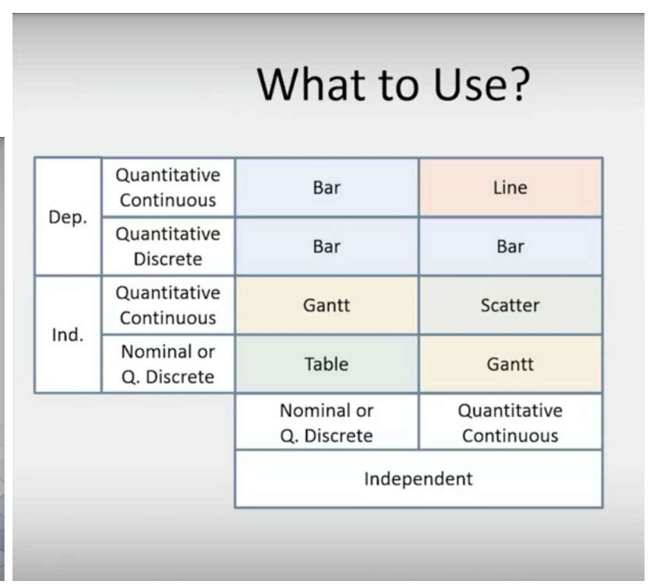

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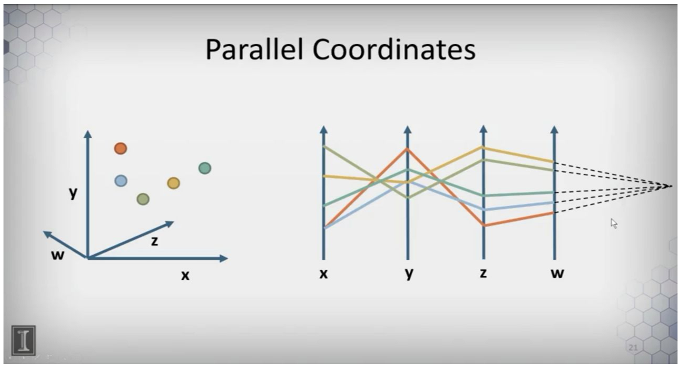

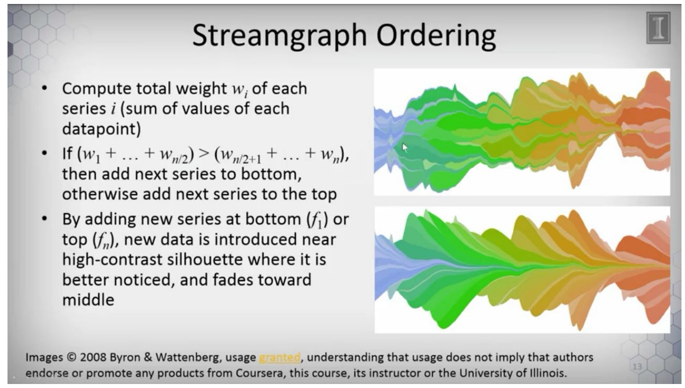

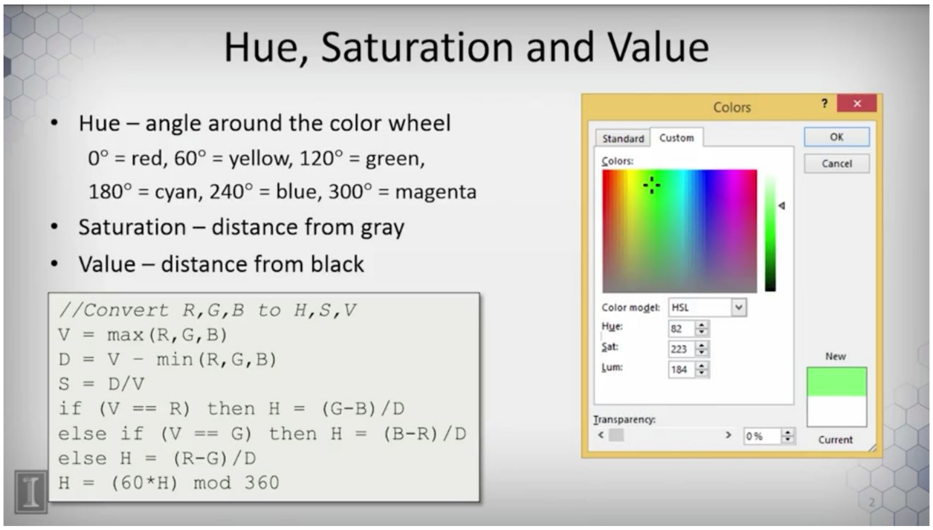

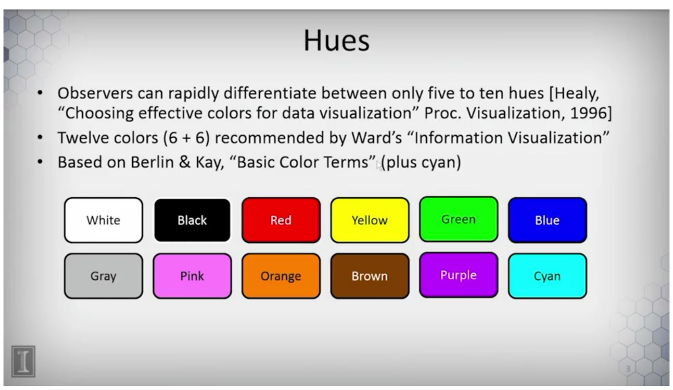

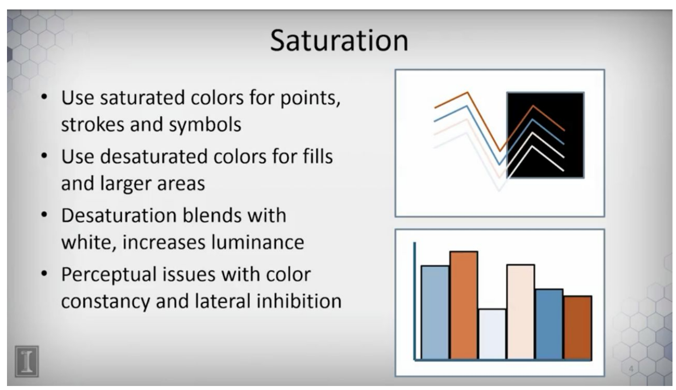

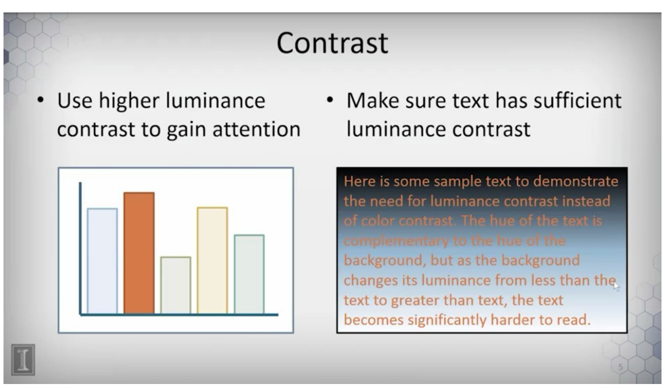

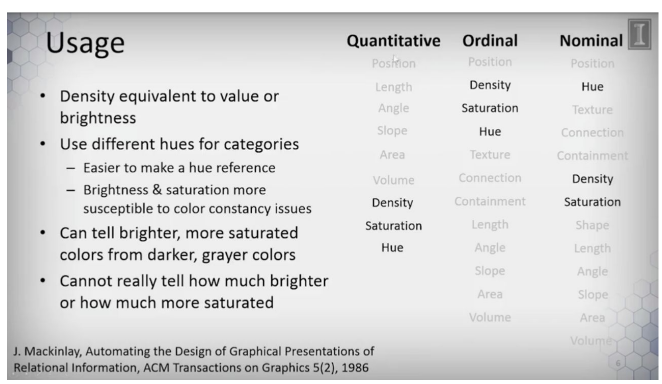

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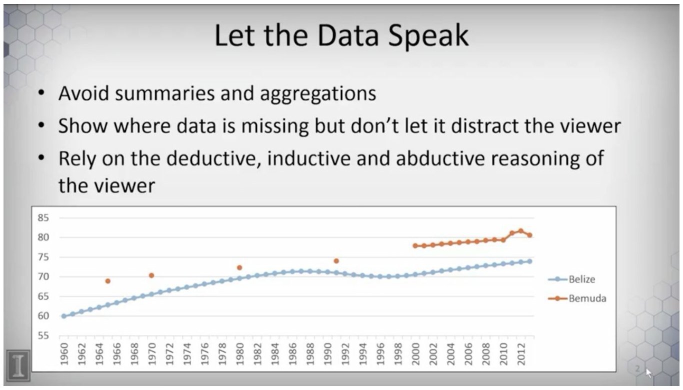
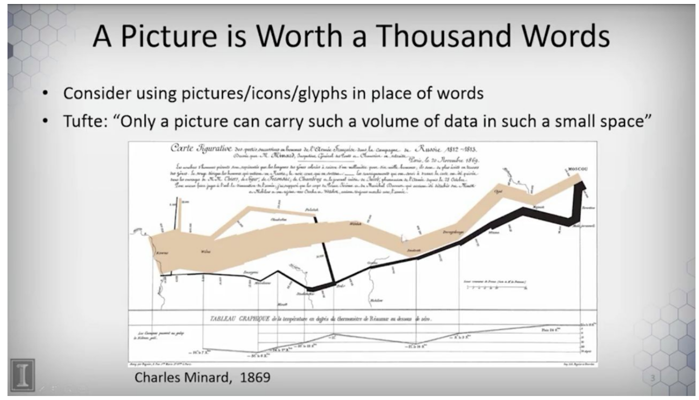
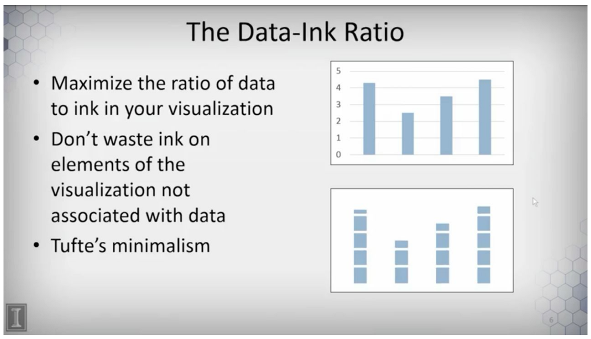
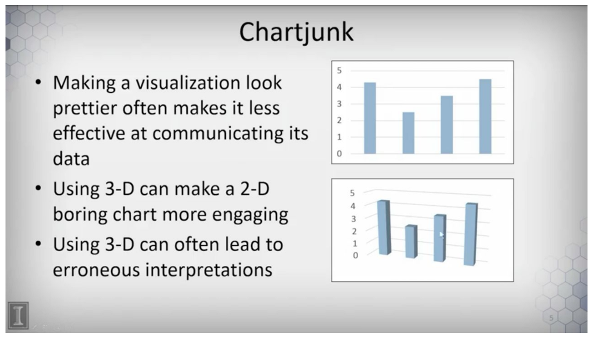
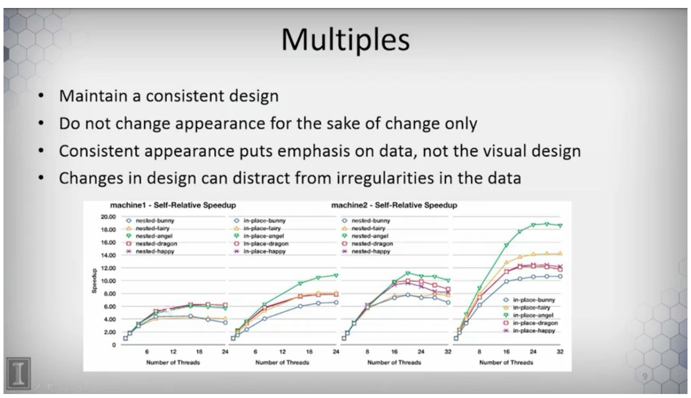
Edward Tufte Pointers

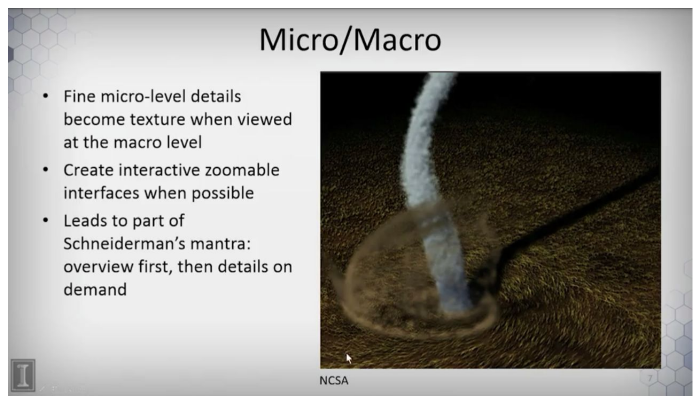


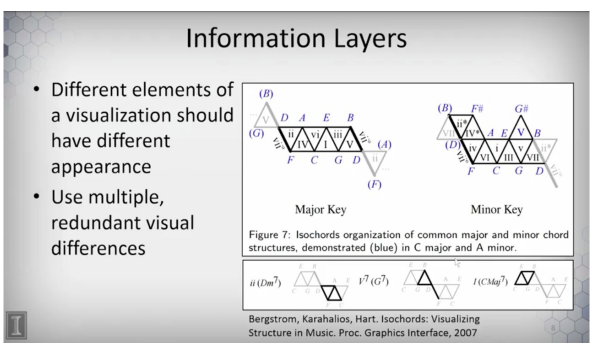


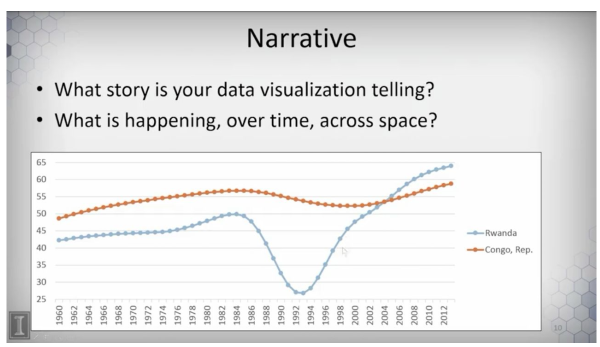


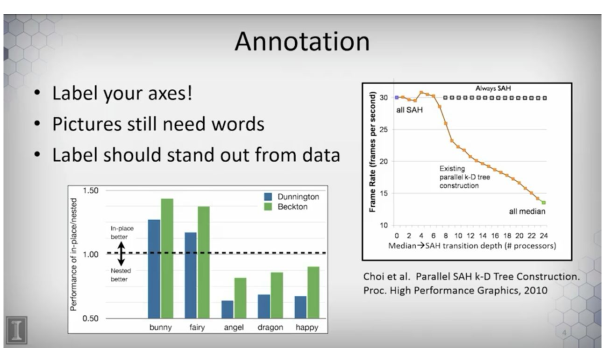












- **Focus on Content not Format**
- **Present wider not taller**
- **Repeat differences together with consistent format**
- **Allow Viewer to Browse from Macro to Micro, not navigate down into**
- **Annotate Links and Causal Arrows**
- **Integrate Text, Images, Icons, etc. for a more complete view of the data**

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