Three key visual presentations

* Gestalt Principles (top-down)
  + The tendency to perceive elements as belonging to a group, based on certain visual properties
  + Concept of totality
    - Grasp the totality before worrying about the details
* Saliency Map (bottom-up)
  + Pay attention to interesting detail first and then integrate these features into a scene
* Pre-attentiveness
  + Certain low level visual aspects are recognized before conscious awareness
* Visual variables
  + The different visual aspects that can be used to encode information
  + Six retinal variables
    - Size
    - Color
    - Shape
    - Orientation
    - Texture
    - brightness

Associative vs Selective

* Associative
  + Lowest organizational level
  + Enables visual grouping of all elements of a variables
* Selective
  + Next lowest level
  + Enables viewer to isolate encoded data and ignore others

Levels of Organization

Table

Description automatically generated

Planar variable is the single most strongest visual variable

* Maps to proximity
* Provides an intuitive organization of information
* Things close together are perceptually grouped together

Size and brightness are good secondary visual variables to encode relative magnitude

* Size appeals to spatial perceptive channels

Advantage and disadvantages of brightness

* + brightness does not consume extra space
* - brightness depends on environmental lighting

Color is a good visual variable for labeling

Shape provides only limited pop-out

* Compare with color pop-out on the previous slide

Brightness is for fine detail contrast

Color encoding

* Large areas: low saturation
* Small areas: high saturation
* Maintain luminance contrast
* Break is-luminance with borders

Pseudo-coloring: assign colors to grey levels by indexing the grey levels into a color map

Rainbow maps maybe bad

Brewer Scales

* Nominal scales
  + Distinct hues, but similar emphasis
* Sequential scales
  + Vary in lightness and saturation
  + Vary slightly in hue
* Diverging scale
  + Complementary sequential scales
  + Neutral at “zero”

Opponent Color

* Do not mix
* Can only see one the opponents