For Network Dataset

DESIGN CHOICES

Connectivity:
- Node-Link graphs
- Good for finding pairwise/multiway relations
- Good for following paths through structure
- Force directed placements

Containtment
- Effective at showing hierarchical structure
- Good for finding attributes of leaf nodes
- Treemaps, nested views

NODE LINK DIAGRAM

nodes - points
links - line

Triangle vertical
radial

understanding network topology

February 2020

18 Tuesday

(049 - 317) Wk 08

SCALAR VISUALIZATION

we will have only one value at any given time

Algorithm classification

1) Scalar algorithms
   - operate on scalar data
   - color mapping, contouring, height Plots

2) vector algorithms
   - operate on vector data
   - hedgehogs, glyphs, derived quantities, stream surfaces, image-based methods

Lunch

3) Tensor algorithms
   - operate on symmetric 3×3 tensors
   - tensor glyphs, hyperstreamlines, fiber tracing, principal Component Analysis

4) Modelling Alg
   - change attributes / or underlying grid
   - implicit functions, distance fields, cutting, selection, grid processing

Eve.

• Early and provident care is the mother of safety •

H - Hue → color
S - saturation
V - value → brightness

February 2020
Wednesday 19
(050 - 316) Wk 08

Rainbow Colormap

- Normalize
- Each unique scalar → unique color
- Color Lookup Table
- Disdv
  - Focus
  - HSV - Hue (color), saturation, Brightness (luminance) (Hue → color)
    last 2 components not used

Gray value Colormap

- Brightness = value
- x-rays, angiography
- Black → min, White → Max, grey → middle
- change brightness to show diff values
- Adv
  - easier to follow & focus, only 2 variations of col
  - less confusing
  - easy to spot difference
  - ordering of color is very natural
    i.e) from dark to bright
  - (rendering) Different devices have different pixels to display
    So problem in showing/reproducing same color
    But black & white no probs → less sensitive to colours
- Disadv
  - cannot distinguish b/w 2 gray scale values
    there might be several shades of gray

• Eat to please thyself, but dress to please others •

February 2020

20 Thursday

(051 - 315) Wk 08

February ◂

Mo	Tu	We	Th	Fr	Sa	Su
•	•	•	•	•	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	•

08 Two-Color / Two hue Color map

- Two hue
- substitute colors for black & white
- ~~ordering of values based on the two colors~~
- Disadv
  - similar to grascale
  - if multiple regions to highlight → rainbow cd map need of ordering colors
  But here only two colors, no need of ordering

13 Heatmap

- to display temparature
- Heated body map
- Yellow to white → max values/high temperature
  black → min/low temperature
  Red to orange → midde remaining/intermediate
- Similar to rainbow colormap, but range of colors is less
- Bit more colors than 2-Hue color maps
- Heat map may be better if ordering of colors as more colors than 2-Hue but less than rainbow

18 Diverging

- Instead of 2 Hues → 3 Hues
- one color → (Mid value) ✳
  low-color → Lower range
  color-high → Higher range
- Interpolate blw colors
  i.e) low-color, color-high

• Education is a progressive discovery of our own ignorance •

Grayscale → Scalar value ~ V
Rainbow → scalar value ~ H
Heatmap → Scalar value ~ H, V

COLORMAP DESIGN TECHNIQUES:

1) Fully use the perceptual spectrum
2) colormaps should be easily invertible
3) Design based on what you need to emphasize

COLORMAP IMPLEMENTATION DETAILS:

High sampling frequency → mesh is smaller
colors are clearly differentiated

Color Banding:

Scalar → Continuous
But if available colors limited → Banding
If colors in Lookup table too close → difficult to distinguish
If " " " " too contrast → deviate from data to design

Contouring:
- a transition separating two consecutive bands } → a Contour
- isolines
- each region → 1 iso value associated

February 2020

22 Saturday 28/01/2022

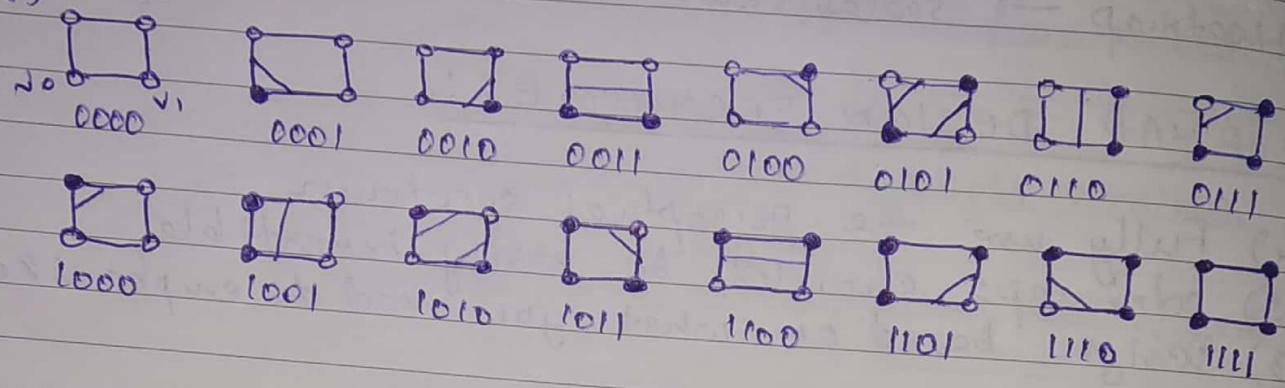
(053 - 313) Wk 08

08 Marching squares

09 dark dots > isovalue

10 v3 v2

v0 v1



Lunch

14

15

16

17

18

23 Sunda

19

20

Eve.

• Education is not preparation for life; ed

February 2020

Monday 24

(055 - 311) Wk 09

VECTOR VISUALIZATION

In scalar → each point → 1 value

vector → each point → array of values
(direction, amount, force)
(waterflow)