





FINAL PROJECT

Proposal due 11/4 10:30am

Data analysis/explainer

Analyze dataset in depth & make a visual explainer

Deliverables

An article with multiple different interactive visualizations Short video (2 min) demoing and explaining the project

Schedule

Project proposal: Mon 11/4 Design Review and Feedback: 10th week of quarter Final code and video: Sun 12/8 8pm

Grading

Groups of up to 3 people, graded individually Clearly report responsibilities of each member

































EFFECTS OF RETINAL ENCODING

Spectra that stimulate the same LMS response are indistinguishable (a.k.a. "metamers")

Tri-stimulus response

Computer displays Digital scanners Digital cameras







COLOR VISION SIMULATORS

Simulates color vision deficiencies Browser plugins Photoshop plugins, etc.



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MUNSELL ATLAS









































BASIC COLOR TERMS

Chance discovery by Brent Berlin and Paul Kay

Initial study in 1969

Surveyed speakers from 20 languages Literature from 69 languages























COLORMAP DESIGN CONSIDERATIONS

- 1. Perceptually distinguishable colors
- 2. Value distance matches perceptual distance
- 3. Colors and concepts properly align
- 4. Aesthetically pleasing, intriguing
- 5. Respect color vision deficiencies
- 6. Should survive printing to black & white
- 7. Don't overwhelm people's capability!















PALLETTE DESIGN & COLOR NAMES

Minimize overlap and ambiguity of color names

Color Name Distance Salience											Name
0.00	1.00	1.00	0.89	0.07	1.00	0.35	0.99	1.00	0.89	.30	blue 50.5%
1.00	0.00	0.99	1.00	1.00	0.92	1.00	0.84	0.98	0.99	.21	red 27.8%
1.00	0.99	0.00	1.00	0.98	1.00	1.00	1.00	0.17	1.00	.34	green 36.8%
0.89	1.00	1.00	0.00	0.98	1.00	0.71	0.93	1.00	0.32	.55	purple 67.3%
0.07	1.00	0.98	0.98	0.00	1.00	0.36	1.00	0.97	0.95	.20	blue 36.6%
1.00	0.92	1.00	1.00	1.00	0.00	1.00	0.97	0.99	1.00	.39	orange 51.99
0.35	1.00	1.00	0.71	0.36	1.00	0.00	0.95	0.92	0.42	.13	blue 15.7%
0.99	0.84	1.00	0.93	1.00	0.97	0.95	0.00	0.98	0.85	.16	pink 29.4%
1.00	0.98	0.17	1.00	0.97	0.99	0.92	0.98	0.00	0.97	.12	green 21.7%
0.89	0.99	1.00	0.32	0.95	1.00	0.42	0.85	0.97	0.00	.30	purple 23.9%
Excel-10						Average 0.87			.27		

















CLASSING CONTINUOUS/QUANT. DATA

- 1. Equal interval (arithmetic progression)
- 2. Quantiles (recommended)
- 3. Standard deviations
- 4. Clustering (Jenks' natural breaks / 1D K-Means)

Minimize within group variance

Maximize between group variance

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DISCRETE CONTINUOUS COLOR ENCODING



SUMMARY

Color perception

Perceptually uniform color spaces better account for how we see color and luminance Beware of simultaneous contrast, crispening, spreading

Color naming

Use colors that are easily distinguished by name

Color palettes

Use small number of hues (about 6) Avoid rainbow palette except in special cases Steal well designed palettes (e.g. ColorBrewer) Consider sequential and diverging scales for quantitative data