Making WAIVS!

Digital Image Analysis, Philosophy & the Arts











R:67	R:67	R:68	R:68	R:70	
G: 47	G: 50	G: 53	G: 52	G:54	
B:40	B:43	B:50	B: 52	B:54	
R:76	R:71	R:72	R:72	R:71	
G: 55	G: 53	G:54	G:54	G: 53	
B: 50	B:49	B: 50	B:52	B:51	
B:76	8.72	P.73	8+75	P+72	
6.57	R+ 53	G: 54	G: 56	C+ 52	
B:53	B:49	B:50	B: 52	B:51	
D+77	P+69	D+ 71	D: 60	B.79	
C. 50	C+50	R. 71	C: 49	R. 70	
8:54	B: 44	B:45	B:45	B: 54	
R:77	R:78	R:79	R:81	R:75	
G: 58	G: 57	G: 58	G:60	G: 56	
B: 52	B: 52	B:53	B: 57	B: 52	
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Richard Estes *Williamsburg Bridge* (1995) Rodin Museum, Paris Rackstraw Downes Henry Hudson Bridge Substructure, A.M. Addison Gallery of American Art

Interdisciplinary Goals

Digital image analysis tools for arts related disciplines

- use the power of big data to study the nature of artistic style
- mine image statistics to explore the results of classification research
- assumption: categories of art = artistic style = image statistics
 - brushstrokes, textures, contours, palette, tonal values, composition, iconography





Lev Manovich (2010). Style Space: How to compare image sets and follow their evolution. Published on softwarestudies.com, retrieved May 19, 2017: <u>http://manovich.net/index.php/projects/style-space</u>



Left: 580 van Gogh paintings Right: 580 Gauguin paintings X = brightness (median)

Y = saturation (median)



- Left: 580 van Gogh paintings Right: 580 Gauguin paintings X = saturation (standard deviation)
- Y = hue (standard deviation)

Impressionists Color Palettes - Saturation (x) and Hue (y)



630 paintings

- X-axis = median brightness.
- Y-axis = median hue.

Interdisciplinary Goals

Computational literacy & STEAM

- use familiar analyses of familiar objects to introduce students in the humanities to STEM related concepts.
 - entropy, standard deviation,
 - the structure of digital images, color reproduction in digital images
 - some understanding of the elements of programming





R:123	R:172	R:106	R:161	R:185
G:118	G:167	G:101	G:156	G:180
B: 96	B:145	B: 79	B:126	B:151
R: 91	R: 69	R: 71	R: 95	R:172
G: 88	G: 67	G: 69	G: 89	G:166
B: 71	B: 46	B: 46	B: 67	B:144
R: 74	R:122	R: 96	R: 92	R:138
G: 71	G:120	G: 91	G: 86	G:132
B: 54	B: 99	B: 69	B: 62	B:108
R:125	R:145	R:123	R:156	R:161
G:120	G:140	G:118	G:151	G:156
B:101	B:110	B: 96	B:122	B:127
R:138	R: 48	R:137	R:168	R:190
G:133	G: 43	G:133	G:163	G:185
B:113	B: 21	B:108	B:133	B:155

STD Matrix (color) Mean STD Matrix Value

Red

Green

Blue

8 0838

7.6783

6.8922

7.5438



Interdisciplinary Goals

Cognitive Science

- visual recognition
 - image statistics, diagnostic features, categorization
 - 60 million inputs/year (3/second)
 - accumulated information
 - some regularities are more likely than others...categories of art











EL CAPITAN, CATHEDRAL ROCKS AND BRIDALVEIL FALL IN MAY + VALLEY VIEW + YOSEMITE NATIONAL PARK





This research is supported by a Natural Endowment for the Humanities Digital Humanities Startup Grant (HD-248360-16) and an American Society for Aesthetics Major Projects Initiative Grant.





Diagnosticity SPATIAL FREQUENCY INFORMATION



Schyns, Gosselin, & Smith (2008) Schyns, Petro, & Smith (2009)



(a) Stimulus

Original

















(i) Bubbles sampling

1 million

(ii) Input stimulus

(b) Diagnostic information



TRENDS in Cognitive Sciences

Diagnosticity



Dali, Slave Market with Disappearing Bust of Voltaire, 1940.

Diagnosticity SPATIAL FREQUENCY INFORMATION



