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What I See When My Eyes Are Closed

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URL http://www.jeffreythompson.org/WhatISeeWhenMyEyesAreClosed

ABSTRACT *What I See When My Eyes Are Closed* is an online data visualization project that documents the approximate colors seen by users when their eyes are closed. The data was gathered using Amazon's Mechanical Turk, a site for crowd-sourced labor. Participants closed their eyes while facing a white screen, they then recorded the color they saw. Their name and location, when provided, are associated to the color. FIGURE 1 shows a screenshot of the results. Research into "soft data" is of particular interest: data sets culled from cultural or personal sources suggest a lack of utility that aligns this kind of information with poetics and removes the often-arbitrary relationship of data-point to image. Specifically, *What I See When My Eyes Are Closed* gives a very human interaction with anonymous Mechanical Turk workers, who are located across the globe. Clicking on a color fills the screen for an immersive view that simulates a temporal shift into that person's body.

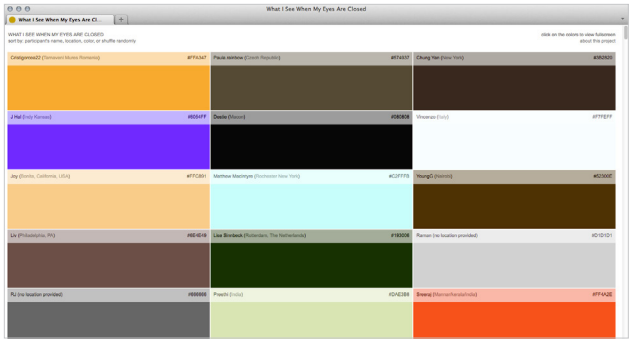


FIGURE 1: *A screenshot of the project; each rectangle is a data point from a single person, including the color seen with their eyes closed and staring at a white screen, their name, and geographic location.*

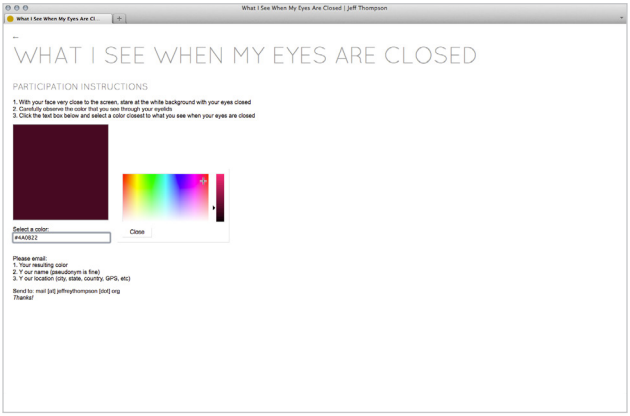


FIGURE 2.1: *A screenshot of the input form; after staring at the blank white space with their eyes closed, workers selected a color using the color selector shown.*

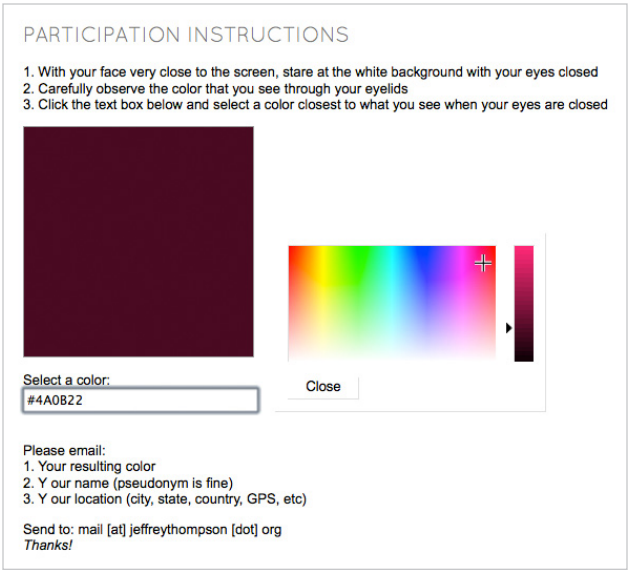


FIGURE 2.2: *A detail of screenshot*

AMAZON'S MECHANICAL TURK

The majority of the data for *What I See When My Eyes Are Closed* was gathered using Amazon's Mechanical Turk, a labor crowd-sourcing service. Workers on Mechanical Turk were paid a small fee to close their eyes and stare at a white computer screen, then record the color they saw as a hexadecimal value along with their name (pseudonyms and handles were allowed instead of a full name) and their location (either as city/state/country or latitude/longitude), see FIGURE 2.

The jobs on Mechanical Turk, called HITs, were put out in two large batches of approximately 200 per batch. The results were returned with surprising speed. The first batch finished within several hours and the second completed

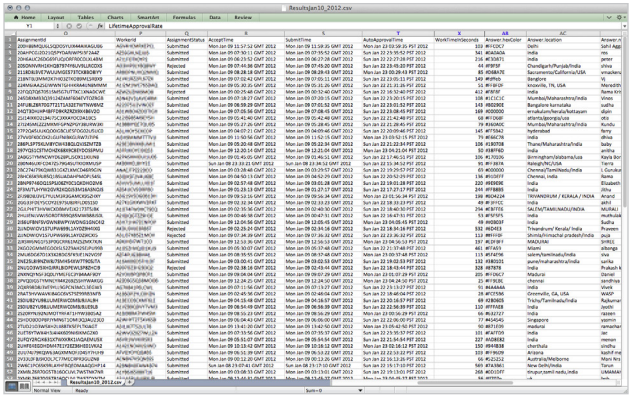


FIGURE 3: *A screenshot of the exported* CSV *file from Amazon; personal data has been obscured here for privacy, but the full file includes information about when the* HITs *were created, a worker* ID *number, whether the work was accepted or rejected, and the amount of time spent on the task.*

over the course of a single day. Based on suggested methods for artistic projects using Mechanical Turk from Andy Baio,[1] whose project, *The Faces of Mechanical Turk,* provides an interesting tactic for humanizing online data mining, the fee paid for each participant was $0.75. At an average of 172 seconds per HIT, this makes the composite hourly wage approximately $15.60. This rate was meant to be fair and considerate of the often anonymous Mechanical Turk workers. In addition the task was an attempt to artistically balance against the bulk of the tasks on Mechanical Turk, many of which are mundane data entry that pay only five or ten cents—or simply ploys to gather working email addresses. The results, including detailed statistics for each task, are collated by Amazon as a downloadable, comma-separated values (CSV) file (see FIGURE 3). This file was converted to a MySQL database, which is read automatically by the project site using PHP for data parsing and formatting the content.

ULESS DATA IN A TIME OF VALUABLE DATA

Prior to the 20th century, a "computer" was a person. Their task was that of performing mathematical calculations. Since many scientists and engineers needed the same kinds of calculations (logarithm tables or lists of prime numbers, for example) the tedious work was best performed only once and then the result published as a reference text. Even as "computer" came to mean what we understand it to be today, access to such calculating machines was limited. Texts of calculations continued to be published into the middle of the 20th century. A complex calculation could be looked up quickly, eliminating the need to write a program and schedule time on a mainframe computer for a single answer.

Today, these books of calculations are virtually useless beyond their historical interest. Their lack of utility, however, transforms the way these texts are perceived. It renders them poetic works, more related to the minimalist grid or color field painting than to the hard sciences from which they were derived. Two works are of particular note and served as a major influence on this project.

Élie Joncourt's 1762 book *De natura et praeclaro usu simplicissimae speciei numerorum trigonalium*[2] is a listing of the "triangular numbers" to nine digits, FIGURE 4. These are numbers which, when stacked, visually form equilateral triangles (numbers squared form squares, hence the name, etc). Printed in 300 pages of fastidious and delicate tables (see example, FIGURE 5), Joncourt's text is now completely useless for scientific work, as a pocket calculator (or smartphone) is faster, more flexible, and not prone to the human error that a book of this size is susceptible to.

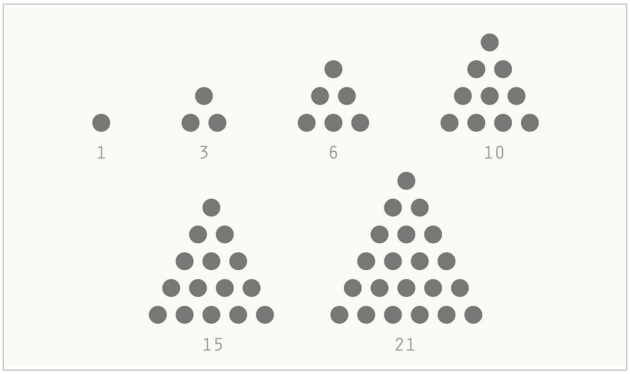
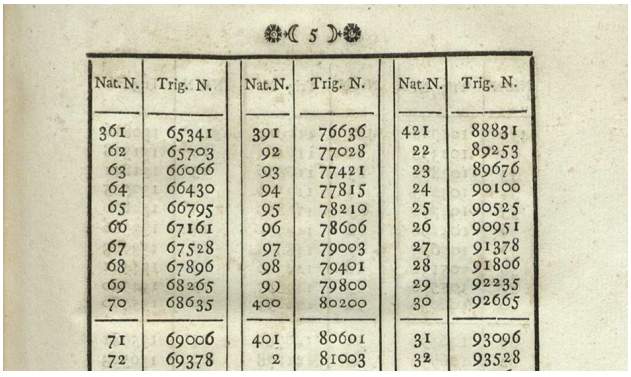


FIGURE 4: *Numbers are "triangular" when, if stacked, they form an equilateral triangle. Here we see the first six triangular numbers (*1, 3, 6, 10, 15, *and* 21*).*



Nat. N.	Trig. N.	Nat. N.	Trig. N.	Nat. N.	Trig. N.
361	65341	391	76636	421	88831
62	65703	92	77028	22	89253
63	66066	93	77421	23	89676
64	66430	94	77815	24	90100
65	66795	95	78210	25	90525
66	67161	96	78606	26	90951
67	67528	97	79003	27	91378
68	67896	98	79401	28	91806
69	68265	99	79800	29	92235
70	68635	400	80200	30	92665
71	69006	401	80601	31	93096
72	69378	2	81003	32	93528

FIGURE 5: *A sample from Joncourt's book. The first number is the "natural" number or base, then that value's resulting "triangular" number*

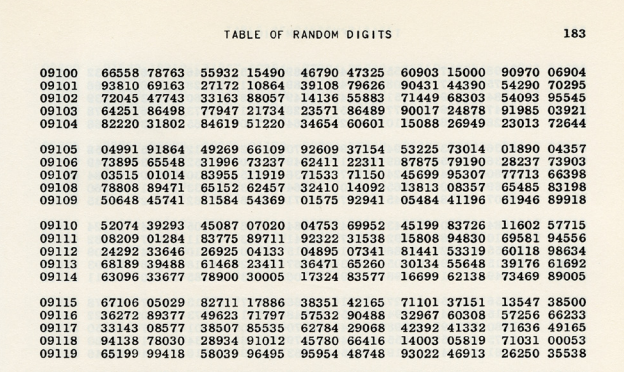


TABLE OF RANDOM DIGITS 183

09100	66558	78763	55932	15490	46790	47325	60903	15000	90970	06904
09101	93810	69163	27172	10864	39108	79626	90431	44390	54290	70295
09102	72045	47743	33163	88057	14136	55883	71449	68303	54093	95545
09103	64251	86498	77947	21734	23571	86489	90017	24878	91985	03921
09104	82220	31802	84619	51220	34654	60601	15088	26949	23013	72644
09105	04991	91864	49269	66109	92609	37154	53225	73014	01890	04357
09106	73895	65548	31996	73237	62411	22311	87875	79190	28237	73903
09107	03515	01014	83955	11919	71533	71150	45699	95307	77713	66398
09108	78808	89471	65152	62457	32410	14092	13813	08357	65485	83198
09109	50648	45741	81584	54369	01575	92941	05484	41196	61946	89918
09110	52074	39293	45087	07020	04753	69952	45199	83726	11602	57715
09111	08209	01284	83775	89711	92322	31538	15808	94830	69581	94556
09112	24292	33646	26925	04133	04895	07341	81441	53319	60118	98634
09113	68189	39488	61468	23411	36471	65260	30134	55648	39176	61692
09114	63096	33677	78900	30005	17324	83577	16699	62138	73469	89005
09115	67106	05029	82711	17886	38351	42165	71101	37151	13547	38500
09116	36272	89377	49623	71797	57532	90488	32967	60308	57256	66233
09117	33143	08577	38507	85535	62784	29068	42392	41332	71636	49165
09118	94138	78030	28934	91012	45780	66416	14003	05819	71031	00053
09119	65199	99418	58039	96495	95954	48748	93022	46913	26250	35538

FIGURE 6: *A sample from "A Million Random Digits"; this continues for several hundred pages.*

A similar text, though far more technically complex, is the Rand Corporation's *A Million Random Digits with* 100,000 *Normal Deviates*,[3] published in 1955. Essentially a tremendous list of random numbers (FIGURE 6), the book begins with an in-depth description of how the digits were created. The creation of truly random numbers using a digital system is not trivial, and the list was extremely useful in its time. Similar to Joncourt's book, *A Million Random Digits* is now a patterned but highly precise scattershot, its function replicable through a single line of computer code.[4]

In contrast, Facebook's estimated $100 billion IPO this year is built around the value of massive amounts of data. With approximately 15 billion images uploaded each day,[5] Facebook's servers hold more than 100 petabytes of photo and video data alone.[6] Brick and mortar stores like Wal-Mart generate massive data collections about customer shopping and buying habits. In 2004, the New York Times estimated Wal-Mart's total data storage at 460 terabytes;[7] by 2010, The Economist reported that Wal-Mart was generating 2.5 petabytes of data per hour.[8] This information is not just valuable to the institutions that create the data, but are secondary products that can be sold to other companies, marketing firms, and political campaigns.

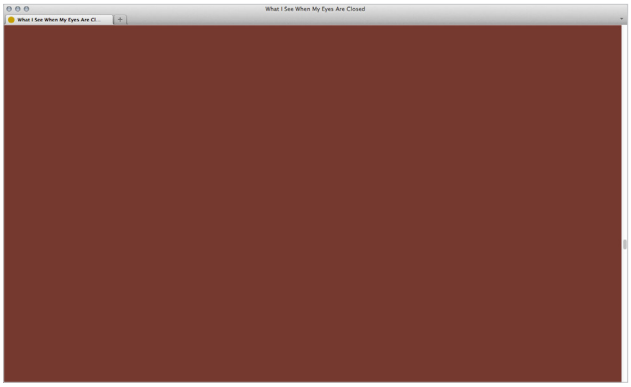
EXPERIENTIAL DATA

Akin to a critical re-reading of Joncourt and the Rand Corporation's now-defunct texts, *What I See When My Eyes Are Closed* is not about a utilitarian use of a data set, but rather about an experiential, patterned, and subjective result from a data-based process. I am particularly interested in the friction data has in relation to poetic and conceptual concerns of the fine arts. Admittedly a somewhat slippery and catch-all term, I use "poetics" to describe a practice whose focus is on creating experiential projects that are not easily described verbally, but rather insist on being phenomenologically experienced. At the center of this kind of data-based artwork there is no utility in the traditional sense of a design or scientific project; the only goal is the furtherance of the poetic experience.

While providing fascinating and often important findings, traditional data visualization and sonification projects tend to have a rather arbitrary link between data-point and form; for example, a triangle could be swapped for a square, orange substituted for red. This cannot be the case with a poetically-focused data practice, where all parts of the work must address and help buttress the poetics of the piece. In the case of *What I See When My Eyes Are Closed,* some decisions were made aesthetically: the presentation as a grid is meant to remove hierarchy and level the data points as well as to reference minimalism and the structure of technical texts like Joncourt's. Other decisions were made conceptually from the internal logic of the project. Allowing visitors to see a full screen view of the color a real person sees with their eyes closed displaces the viewer, swapping their temporal presence momentarily with the faceless laborer who created that content (see FIGURE 7).

Closer to this project, then, are works such as Markus Kison's "Touched Echo", a public sound installation addressing the bombing of Dresden in World War II. Visitors are instructed to lean on a metal railing with hands cupped by their ears. "When one leans on the balustrade the sounds of airplanes and explosions" conducted as vibrations through the elbows, up the arm bones, and into the skull and experienced through the ears—no sound is present except through this physical gesture.[9] Opposite of what Douglas Kahn calls the "deboned voice"[10] of the phonographic recording, "Touched Echo" reinforces the personal experience of what might otherwise be a set of figures and photographs.

FIGURE 7: *A detail of "What I See When My Eyes Are Closed". Clicking anywhere on the color brings the selection fullscreen; clicking on the location opens a Google Map of the location.*



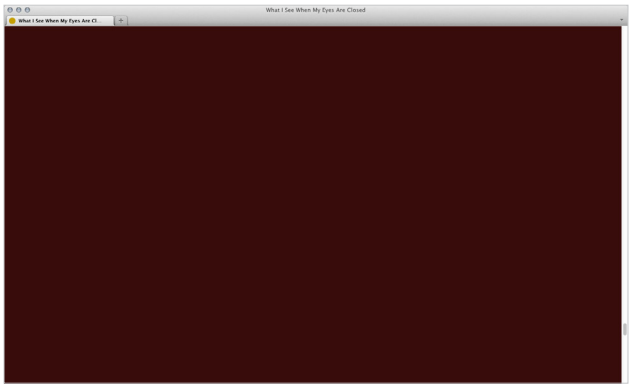


FIGURE 8 *and* 9: *Two fullscreen color examples, the first from a woman named Antoinette from Long Beach, California (the color is* #7A3833*), the next from a worker using the handle Dopler6 from Belgrade, Serbia* (#3B0C0D).

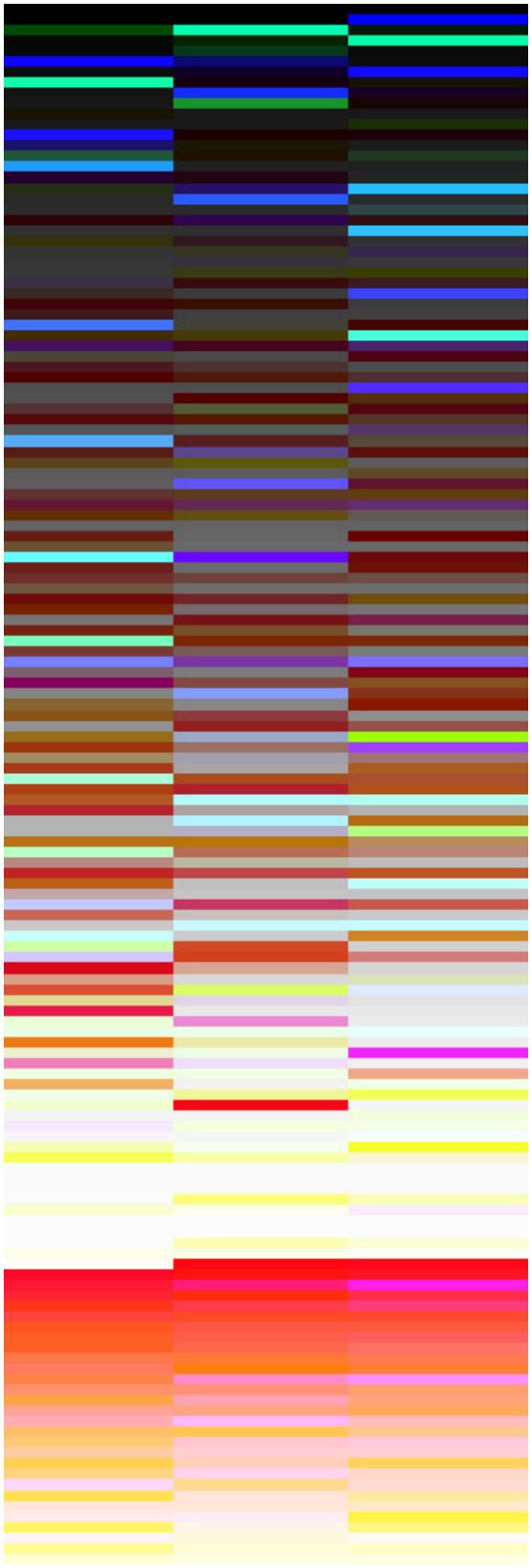


FIGURE 10: *Using the powerful realtime features of the* MYSQL *database format, the data can be sorted by color value, name, geography, or be randomly shuffled. This function is not intended to reveal new statistical properties of the data set or as a method to find patterns in the data; rather, it suggests a narrative arc through the information and prioritizes certain data points that might otherwise be lost. Here we see the data set sorted by color (note this is not as seen on the project site, but a visualization so the entire data set can be seen).*

This connection to the physical is important in the case of *What I See When My Eyes Are Closed,* as the colors we see are due to the thickness of the skin of the eyelid—a highly specific detail of a person's anatomy. The gesture of sitting in front of a computer screen with eyes closed is intimate and political as well, a meditation amid the highly commoditized database structures of e-commerce and remote labor. The color values are the result of a poetic experience between the worker and the interface. This personal data is then re-presented in a database format and retrieved by the web browser when called by the viewer. Sorting the data by color, name, or geography is not about finding usable patterns (people from southeast Asia tend towards this kind of color, etc), but is instead about creating new narrative pathways through the data set (see FIGURES 8, 9, and 10). In its final form as fullscreen color the viewer is placed in a simulated body, a telepresent moment which argues that data can be gathered, parsed, and presented with a focus on the experiential and poetic. The eyelids of an anonymous worker are transposed with ours and for a moment we "see through their eyes".

BIOGRAPHIES

Jeff Thompson is Assistant Professor of New Genres and Digital Arts at the University of Nebraska-Lincoln, where he is also artist-in-residence at the Holland Computing Center. Thompson has exhibited his work internationally, most recently at SITE Santa Fe, Bemis Center for Contemporary Arts, the Sheldon Museum of Art, and the Taubman Museum of Art.

NOTES

1 Andy Baio, "The Faces of Mechanical Turk," (accessed March 20, 2012. http://waxy.org/2008/11/the_faces_of_mechanical_turk).

2 Élie de Joncourt, *De natura, et præclaro usu, simplicissimæ speciei numerorum trigonalium. Accedunt canones, quorum ope ardua quædam...problemata...solvuntur* (1762), http://dfg-viewer.de/v2/?set[mets]=http%3A%2F%2Fwww.zvdd.de%2Fdms%2Fmetsresolver%2F%3FPPN%3DPPN578840553&set[image]=1

3 Rand Corporation, *A Million Random Digits with* 100,000 *Normal Deviates* (Glencoe: Free Press, 1955).

4 "High quality" random numbers, it should be noted, are still not a trivial matter to generate. That said, virtually all programming languages have a built-in random number function, often accomplished using the current date and time (to the millisecond) as a "seed."

5 Doug Beaver, "10 Billion Photos," http://www.facebook.com/note.php?note_id=30695603919 (accessed March 20, 2012).

6 "Facebook's Filings," The New York Times (February 1, 2012), http://bits.blogs.nytimes.com/2012/02/01/facebooks-filing-the-highlights (accessed March 20, 2012).

7 Constance L Hays, "What Wal-Mart Knows About Customers' Habits," *New York Times*, (November 14, 2004), http://www.nytimes.com/2004/11/14/business/yourmoney/14wal.html (accessed March 20, 2012).

8 "Data, Data Everywhere," *The Economist* (February 25, 2010), http://www.economist.com/node/15557443 (accessed March 20, 2012).

9 Markus Kison, http://www.markuskison.de/index.html#touched_echo (accessed March 20, 2012).

10 Douglas Kahn, *Noise Water Meat* (Cambridge: MIT Press, 1999), 7.