Move Your Eyes

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13 milliseconds is the time it takes for the human eye to process an image.[1]

Few images these days can be perceived in a "slow" context. The above quote citing MIT neuroscience research[2] aligns with oft cited studies critiquing viewers' attention spans in museum gallery environments. According to James Elkins,

> One found that an average viewer goes up to a painting, looks at it for less than two seconds, reads the wall text for another 10 seconds, glances at the painting to verify something in the text, and moves on. Another survey concluded people looked for a median time of 17 seconds. The Louvre found that people looked at the Mona Lisa an average of 15 seconds, which makes you wonder how long they spend on the other 35,000 works in the collection. A survey at the Metropolitan Museum of Art supposedly found that people look at artworks for an average of 32.5 seconds each, but they must not have counted the ones people glance at.[3]

What kind of time do we enter when observing works of art? Speed is relative. Aesthetics by and large operates at orders of magnitude slower than neurology. Like the click data trafficked below pixel compression, the mechanics of our perception operates below surface awareness.

Animation cycles a clip faster, superimposing one image upon the other in procession to create the illusion of motion. 24 frames per second, or 24 Hz, is the industry standard for animating film. Mathematically, that equates to roughly one image every 42 milliseconds, but physiologically the persistence of motion is a variable threshold—perception may vary. Yet in essence, animation speeds remain *three times greater* than the minimum 13 millisecond threshold for visual comprehension.

What may have been forgotten in the history of machine automation is the fact that early silent films were hand-cranked, and projectionists often changed the rate during the scene to fit the mood.[4] However "when sound film was introduced in 1926, variations in film speed were no longer tolerated, as the human ear is more sensitive to changes in audio frequency."[5] Today, HD video is broadcast at 50-60 Hz, which at 16 milliseconds per frame roughly approximates the upper level of visual cognition. Considering that 120 Hz gaming monitors are routinely overclocked to push upwards of 200 Hz, so it's fair to say that the technology behind mass media digital imagery has

exceeded the threshold of casual awareness.

What is the narrative of 13 milliseconds, three times faster than the persistence of motion? The MIT study holds that the brain likely continues to process the image the after the initial retinal exposure,[6] which sounds a lot like the afterimage you experience after staring at a bright light. Researchers have also suggested that by progressively increasing speed in the experiment, they enabled participants to practice fast detection. This holds true with known techniques that teach speed reading, which traditionally train the eye to scan the page as a dimensional space while tracking for keywords and filtering conjunctions.

The digital version of speed reading relies on a simple mechanical acceleration—Spritz is just one brand of text based reading software that flashes one word at a time in quick succession, technically known as *rapid serial visual presentation* (RSVP).[7] It's optimized for mobile devices, where scrolling through a large article on a small screen becomes tedious. Readers can progressively dial up speeds, from 250 words per minute to 1000.[8] 1000 words per minute equates to 60 milliseconds per frame—plenty of time both to see and process the mental afterimage of its characters. This upper threshold of perception is the practical limit of consumption, but the gauge of deep contemplation, at least for art's sake, is not quite as quantifiable as the studies Elkins cites.

Enter search terms here

Meanwhile, with the vast preference for image consumption geared towards a private mediation of both personal computing and algorithmic search retrieval, the digital environment is hardwired for speed. Already the distance of an electrical input/output synapse—halfway around the world if need be—seems as long forgotten as dial-up connection speeds. Physical lines of communication in cities are nowadays buried underground, so the infrastructure is invisible. The only physical constraint on data seems to be one's proximity to the likewise unobtrusive telecommunications tower.

Although industry is fueled by the formula 'faster is better,' speed doesn't underwrite the very privilege of access that the internet provides. Information, like images, although seemingly free to peruse, acquire, and trade on an open market, is subsidized by the data trafficking of point-and-click choices. The demand for user-generated data points implies that there is more information being processed than just images racing at the speed of retinal exposure. Yet this infrastructure is also invisible.

Take search as the primeval question. It's not called an engine for nothing. Each and every click upon the results page returns a probability spread of your actions to the engine's database. There it quantifies judgement—just as each and every choice presented has already been refined from the open sea of choices available. By returning value-added

to the whole data set, the engine insures the accuracy of future inquiry. Future choices are in turn predetermined by my actions as a user. This is the concession of living in a digital network, where a certain casual jurisprudence is motivated by the relative success of guiding paths.

Seen through the lens of networked answers, what then does it mean to truly look, and how can search invigilate an open debate? For networked digital culture, the act of questioning triggers a fast-twitch surplus of questions already asked, questions already answered—either way questions which the network outsources one way or another. But empirically, when 'a picture is worth a thousand words,' the accuracy of returns statistically favors reducing those thousand words to a hash. *Populist reductivism seems to be the fate of search algorithms.* That is an opinion. Or a fallacy at worst. A study of both the tendencies and influence of data processing on neoliberal politics deserves further study, because the very access to demographics is the first step to targeting them. The filter is always political. It may be disheartening then, to think that the extremity of capitalist perversion—perhaps given its access—is fueled by a familiar filter. *Nine out of 10 start-ups fail.*[9] The very mechanism, or medium you might say, faces the same attrition as its content.

I repeat, nine out of 10 start-ups fail

This visionary future offered by technology sector needn't encourage failure alone, because the ballast of consumer desire flushing dime-a-dozen ideas is the play of the free market. Technological Darwinism is not geared by quarterly profits, but rather earning the next stage of funding—with the more distant promise of future monetization. Balancing supply and demand goes clear out the window in tech, where business models are skewed towards releasing functional tools and creating demand in the present. Given the abysmal success rate, it can be more profitable to build a network and prime consumers within a market niche than it is to immediately post dividends—and aim for a buyout instead of an IPO.[10] While the model isn't inherently prone to market saturation, there is still enough competition for parent companies to let the startups duke it out before declaring a clear winner.

In simple terms, Google became a verb synonymous with search because their algorithm was clued in to knowing that the best results are qualitative, not quantitative. Quality is certainly not the essence of speed, except perhaps when it's a competitive advantage. Even harder to qualify are personalized network recommendations—there's a revised 'terms & conditions' for that. Google's advantage was understanding the network in the first place. Opposed to competitors (Lycos, Yahoo!, and Alta Vista at the time) who used text analytics, Google wrote PageRank[11] to collate redirect links from other sites in

order to both populate and rank search results. PageRank also looks to see where others sites are looking, qualifying a citation authority. And although it's not the only algorithm they use nowadays to rank search results,[12] it was the one that first separated them from the field.[13]

It's not rocket science, but the simple model of seeing through the eyes of consumers drives e-commerce. Now Google can name their price to skew those statistics and bump ranking positions to the highest bidder. I'm not referring here to the paid for targeted adspace, which makes the free service model of search appear balanced on the surface. The politics of looking—and searching—is much more subversive. Google's model takes already preferential recommendations, which they acquire for free, and further monetizes the ranking on a competitive market.

It's not all that bad; access to more information is generally a good thing. Who has access to that information is another question, since access is always a privileged position of leverage. I want to be clear that both search and looking are questions played out under the politics of rendering predisposed answers. *Speed* is the crucial part of the transaction here, because speed is profitable. I am further suggesting that this information returned by search algorithmically stultifies the very questioning it decrees, because it is invariably inflected by market determinants. *Algorithm tweaking is the stacked deck of 21ˢᵗ century lobbying*. We all know visual perception is necessarily filtered, so why shouldn't data?

Just keep scrolling

It's a simple exchange, built upon the same model that governs high frequency trading. Except that the unrequited exchange trades personal data for adspace. Online, an advertiser can buy a square pixel of space, from Facebook for example, simply to access your cookies.[14] And in a split second—we're talking milliseconds here—make competitive bids against other advertisers. The winning bid pays Facebook to push their ad into your allocated rectangle. All of this happens in the time it takes for the page to load—computers do the bidding and ad customization instantly. The accumulated preference of looking through clicks identifies you as a consumer and narrows your interests. Before you click, it's already been determined what type of images you will respond to.[15] But it's not only the image, the browsing experience is also determined—as much by the medium[16] as the very momentum of your search history. So just keep scrolling.

Before form feed printing, the ancient scroll had returned to modern computing via dot matrix—those tear-away perforations that guided paper like film through sprocketed printers. The scroll modeled aural history in its very form, reel to reel, to tell and retell. But the circuit of visual processing is not a pure loop. Between two spools, one

uncoiling and the other recoiling, the eye's 13 millisecond read speed seems to be the faster—where the brain's afterimage buffering can never entirely keep pace. Lead researcher of the MIT project Mary Potter comments,

> The study offers evidence that 'feedforward processing'—the flow of information in only one direction, from retina through visual processing centers in the brain—is enough for the brain to identify concepts without having to do any further feedback processing.[17]

All the eyes need is a little direction, like an algorithm obviating the irrelevant data. Potter continues,

> This rapid-fire processing may help direct the eyes, which shift their gaze three times per second, to their next target, Potter says. 'The job of the eyes is not only to get the information into the brain, but to allow the brain to think about it rapidly enough to know what you should look at next.[18]

Technologically, this mental process has clearly been outsourced to compete at the limits of physiology.

The mechanical form feed now adopted by RSVP software like Spritz has collapsed the linear page, compressing virtual paper space into a flickering animation. The brain doesn't have to tell where the eye to look, it is predetermined by Spritz's 'Optimal Recognition Point' or ORP. This centering technology allows you "to read without the need to move your eyes."[19] Flattening digital perceptions mirrors the fact that digital memory has no hierarchy—it's simply a path to a drive partition, distributing data points to optimize collated retrieval. In order look, we predefine a target. Algorithmic search first narrows preference, and RSVP software eliminates navigation entirely.

How long do you really need to look at a painting, and how much of that dedicated contemplation is spent on slowly choosing where to angle your gaze? For the Romantics staring towards the horizon, paradise was already long gone. Is not the prone inefficiency of looking already a nostalgia for searching? When perceptions finally give way to optimization, digital content will be rendered as pure computation. It will be the end of conceptual art, and perhaps objects entirely—a genre that fully eliminates the need to move our eyes.

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1. http://www.dailymail.co.uk/sciencetech/article-2542583/Scientists-record-fastest-time-human-image-takes-just-13-milliseconds.html (accessed 28 August 2016).

2. http://news.mit.edu/2014/in-the-blink-of-an-eye-0116 (accessed 3 August 2016).

3. http://www.huffingtonpost.com/james-elkins/how-long-does-it-take-to-_b_779946.html (accessed 14 August 2016).

4. https://en.wikipedia.org/wiki/Frame_rate (accessed 29 June 2016).

5. Ibid.

6. http://news.mit.edu/2014/in-the-blink-of-an-eye-0116 (accessed 3 August 2016).

7. http://spritzinc.com/the-science (accessed 3 August 2016).

8. http://www.digitaltrends.com/mobile/hate-reading-slowly-spritz-aims-allow-people-read-1000-words-

per-minute/ (accessed 3 August 2016).

9. http://www.forbes.com/forbes/welcome/?toURL=http://www.forbes.com/sites/neilpatel/2015/01/16/90-of-startups-will-fail-heres-what-you-need-to-know-about-the-10 (accessed 14 July 2016).

10. When Instagram was sold to Facebook for approximately $1 billion, they had yet to monetize. Facebook already had that inbuilt infrastructure, so the acquisition seemed like an easy loop for the in-house strategists to close, simply by simply mapping personal accounts from one service to the other.

11. https://en.wikipedia.org/wiki/PageRank (accessed 13 September 2016).

12. http://backlinko.com/google-ranking-factors (accessed 13 September 2016).

13. https://en.wikipedia.org/wiki/PageRank (accessed 13 September 2016).

14. Ibid. pp. 274-276. "[...] monetization is the amount of data per pixel: the more data you bring to bear for every inch of screen real estate, then the more that ad will be worth."

15. Ibid. "Targeting is the set of data and tools that advertisers use to define a set of users. It can be demographic in nature (e.g., thirty-to-forty-year-old females), geographic (people within five miles of Sarasota, Florida), or even based on Facebook profile data [...]."

16. McLuhan, 2001. pp. 24-35.

17. http://news.mit.edu/2014/in-the-blink-of-an-eye-0116 (accessed 3 August 2016).

18. Ibid.

19. http://spritzinc.com/the-science