Cultural Analytics at Work: The 2008 U.S. Presidential Online Video Ads

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Note: hi-res color versions of the visualizations in this article, as well as a number of additional visualizations related to this study are available at: http://lab.softwarestudies.com/2010/12/2008-us-presidential-campaign-ads.html.

Culture comes in the form of data.

Data, data, data. We have lots of it. Today's techno-cultural landscape is characterized by a steep increase in the amounts of data captured, processed, archived and generated. Not only have the cultural storehouses of old gone digital, thereby creating a vast global database of existing cultural artifacts, we are constantly generating *new* cultural artifacts – cultural artifacts born digitally, in the form of data. Our global cultural database is exploding, and one catalyst for this explosion is the evolving medium of online video. This subset of the cultural database, which has been growing rapidly since 2005, has become a field of increasing critical curiosity alongside its expanding significance for artistic, social and political use.[1] In what follows, I will be proposing a research methodology appropriate to the scale and potential impact of online video. Over the past two years, the Software Studies Initiative at the University of California, San Diego (UCSD) has been developing *Cultural Analytics,*[2] a new methodology for researching and teaching visual and interactive media. As a member of this initiative, I explore how this methodology might apply to the analysis of online video. To illustrate one potential application, I turn to a specific set of video clips used as advertisements during the 2008 U.S. presidential campaign.

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[1] Examples of this increasing critical curiosity include numerous web and blog commentaries, academic and industry organized conferences and a growing list of recent publications: Video Vortex Reader (2008), YouTube: Online Video and Participatory Culture (2009), The YouTube Reader (2010) and Watching YouTube: Extraordinary Videos by Ordinary People (2010).

[2] http://lab.softwarestudies.com/2008/09/cultural-analytics.html.

During their campaigns, both Barack Obama and John McCain hosted their own YouTube channels, and used the online video portals to showcase speeches, interviews, commercials and debates. The adoption of this new medium as a political communication tool provides a unique and timely opportunity for exploring the cultural implications of online video: for example, for the way we understand form and visual design, and for the way visual rhetoric works on the socio-political scale of the internet. The preliminary analysis that follows looks at the role online video had to play in the campaigns by way of revealing differences and patterns in visual form, through two comparisons: 1) between advertisements originally designed for television and for web broadcast and 2) between advertisements for Obama and for McCain.

The Data-Image
The millions of users creating, sharing, viewing, tagging and commenting on video through a multitude of online video sharing and social-networking sites results in what can justifiably be termed a territory of online video data. Like much of the data in our digital cultural database, this data comes encoded in a form defined by the cycle of cultural production and consumption that characterizes contemporary social and technological infrastructure. We can think of this visual manifestation of data form as the *data-image*. The encoding process for the data-image is collective and dynamic. If offline moving-image content, both analogue and digital, engenders culture through the viewer's reception of the medium, then online moving-image content propagates culture through the user's direct interaction with the image and, because the image is in the form of data, through the user's direct interaction with data.

The story of the data-image doesn't end there. Based on this interaction, the web's participatory architecture builds metadata into the content of the image. As techno-doubters and techno-utopists alike have pointed out, the ability of viewer reception to affect the trajectory of cultural content is, in and of itself, nothing new. It is not that an ancestral version of the data-image was not possible in the age of offline media. What is unique to the cultural experience of online video production and consumption is the frequency of transformation. Because online media interaction and dissemination is literally written into the media content and can be quantitatively measured, the form that online media takes can assume *infinitely more iterations,* and this form is selected for and transformed at the pace of fibre-optic cables. This revs up both the speed and scale at which media interaction and form can lead to cultural ideas, flows and stylistic preferences.

Online Video: The Challenge of 'Watching' the Network
The availability of this amount of data, and of data that feeds upon itself, generates a repository of image-based cultural material unparalleled in size, and potential relations. This body of material proves challenging for our standard 19th and 20th century ways of representing and understanding culture, which typically involve the methods of close reading and/or comparative qualitative analysis of a relatively small sample set. Using these methods, how could we even begin to explore the type of cultural innovation

associated with online video, which involves hundreds of billions – and soon trillions – of objects and histories, linked together on a global scale? Take the following statistic: as of May 2010, 24 hours of video are uploaded to YouTube every minute and, taken as a whole, the global community of users watch over two billion videos per day.[3] Any individual scholar, group of scholars, or even entire universities or think tanks, cannot possibly view all this material, parse it, or draw insightful conclusions about the relationships constituted by it based on anything but sheer intuition. Computers can.

Currently, many realms of scientific and social inquiry have embraced this solution. The sciences, business and government all rely on computer-based processing and analysis to explore similarly large datasets. The developing fields of information visualization, scientific visualization, and visual analytics are the outgrowths of computerized methods of analysis. The commonality between these methods resides in the technique of visualization. Because of the breadth of its application and use, the term visualization eludes exact definition independent of context; in general, however, the visualization of large datasets involves mapping data onto a visual display for the purposes of discovering and/or communicating data structure. Thus, visualization holds tremendous aesthetic and cognitive possibilities for uncovering patterns and understanding relationships.

The arts and humanities have, however, begun to catch on. In the interdisciplinary field of digital humanities, people are using computer power to mine, process and represent large quantities of data. However, the cultural content selected for analysis is usually canonical texts: those deemed influential enough to be worthy of further investigating the rules and questions driven by *ex post facto* historical assessment. History is not objective. Moreover, very rarely does this cultural data excavation involve images, let alone video, and very rarely does it delve into the wealth of contemporary cultural material.

Companies such as Amazon, Google and Neilsen do capture and visualize a subset of the exploding cultural database – data based on use. Amazon showcases this data in preference lists and recommendations, Google in the graphs and links found on Google Trends, and Neilsen in information available through BlogPulse. YouTube also has its version in the pull-down menu that is placed next to the view count. While these efforts are important and necessary for understanding the cultural content on the web, they stop short of pairing this reception-based data with data inherent to the characteristics and form of the content itself. If online video constitutes a new visual medium, might it not make sense to include the visual form of this medium within the analysis of data?

One reason for the absence of a broad scale cultural or stylistic analysis of new media content might be our assumptions about what it means to reflect upon the present. Currently available methodologies for arriving at cultural or aesthetic theory make it difficult to know whether it is feasible to cultivate a critical theory of cultural

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[3] http://www.youtube.com/t/fact_sheet, accessed September 25, 2010.

developments as they occur in real time.[4] The negative response centres on the argument that we need perspective to be critical, and that perspective necessitates temporal distance. I would call this argument opinion. Culture is changing, and the mechanisms of perception and analysis are changing with it. Why wait until a particular cultural form has played out, and then attempt retrospectively to fit cultural change into tidy and often arbitrary forms of classification? Why not embrace the variety and continuity of the present? And why, when cultural content and dynamics are so intimately tied to the residues of our interaction, should we wait to achieve a 'situational awareness' of our present, and by extension our future? How do we begin to explore, conceptualize, and reflect upon, in real-time, the artifacts and interactions that comprise today's techno-cultural datascape?

Welcome to Cultural Analytics.

Cultural Analytics as Cultural Exploration

As a methodology, Cultural Analytics offers a new paradigm for cultural analysis and information visualization. This paradigm matches the data-explosion of networked and ubiquitous cultural creation with the processing power of computers. This paradigm brings the cultural exploration of comparably large datasets in line with the techniques and methods of the most data-intensive scientific and business inquiries. This paradigm focuses on real-time visualizations of data that dare to ask challenging theoretical questions about the form and trajectory of current cultural artifacts, dynamics and flows.

Elements: Defining the Cultural Analytics Methodology
Cultural Analytics feeds off today's techno-cultural landscape. It borrows from methods for the quantification and analysis of data: statistical data analysis, information graphics, information visualization, scientific visualization and computer simulation. However, the following characteristics distinguish the cultural analytics paradigm from these related methodologies:[5]

1) *Exploring and visualizing the global dynamics and flow of cultural form, ideas and change* across multiple scales and on all possible dimensions. Such an approach is particularly relevant, if not necessary, in an era when cultural change, on global and local scales, occurs rapidly and through a complex network of technological and social mechanisms.

4　　Geert Lovink, 'The Art of Watching Databases – Introduction to the Video Vortex Reader,' in Geert Lovink and Sabine Niederer (eds) *Video Vortex Reader: Responses to YouTube*, Amsterdam: Institute of Network Cultures, 2008, p. 9. Available at http://networkcultures.org/wpmu/portal/files/2008/10/vv_reader_small.pdf.

5　　For a more detailed explanation of these traits as well as other characteristics of Cultural Analytics see Lev Manovich and Noah Wardrip-Fruin, 'Cultural Analytics: white paper,' (May 2007, latest update November 2008), http://lab.softwarestudies.com/2008/09/cultural-analytics.html.

2) The *use of very large datasets currently available* on the web and/or in digital form.

3) A *focus on visual and interactive media data* including, but not limited to, film, animation, video games, comic, publication layout and design and websites.

4) A *focus on contemporary cultural data* and understanding the present with an eye towards the future. In other words, developing a *real-time 'situational awareness' for 'cultural analysts'.*

5) The use of all of the above to expand the boundaries of current cultural analysis, and *investigate challenging theoretical questions with aesthetic, social and political implications for today and the future*.

A Productive Pairing: Cultural Analytics and Online Video
We can map each of the above traits of Cultural Analytics onto the territory of online video in the following way.

1) *Online video proliferates. It is a cultural form based on the flow and sharing of ideas across a global network.* Henry Jenkins grounds this capacity of online media in the ease of 'spreadibility'.[6] Jenkins writes that 'It is through this process of spreading that the content gains greater resonance in the culture, taking on new meanings, finding new audiences, attracting new markets, and generating new values'.[7] 'Spreadibility' may also drive changes to cultural form. Cultural Analytics can map this and give us the visual language to open discussions about contemporary cultural change.

2) *The staggering amount of data available on leading online video-sharing websites provides the very large dataset*. Yet, these large datasets are not always freely or easily accessible. YouTube Insight, a self-service analytics tool, does provide detailed viewing statistics, but this data is only available to YouTube users for the videos they have uploaded. Obtaining video shared by others is equally difficult. YouTube, Vimeo, Tudou and Youku all prevent the direct download of files. To obtain content data, third-party tools are necessary. Keepvid and Savevid, which allow you to download and save videos from video sharing and streaming sites, are two of the most popular. However, video-sharing sites often block this software, along with any customized scraping scripts. Copyright and licensing issues also pose difficulties. What content can be shared and by whom? How long is this content allowed to remain on video-sharing sites? Who can access the associated data? An additional question is whether obtaining and distributing content as a form of data

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6   The term 'spreadibility,' which refers to Jenkins' concept of 'spreadible media' is borrowed from Jean Burgess, '"All Your Chocolate Rain Are Belong to Us?" Viral Video, YouTube and the Dynamics of Participatory Culture,' in Geert Lovink and Sabine Niederer (eds) *Video Vortex Reader: Responses to YouTube,* Amsterdam: Institute of Network Cultures, 2008, p. 102.
7   Henry Jenkins, 'Slash Me, Mash Me, Spread Me...,' Confessions of an Aca/Fan, Henry Jenkins Weblog, 24 April, 2007,
      http://www.henryjenkins.org/2007/04/slash_me_mash_me_but_please_sp.html.

analysis falls within the realm of fair use. These are bugs for Cultural Analytics to work out. Fortunately, Cultural Analytics is philosophically open-source and doesn't resign itself to using easily available data. It looks for interesting data.

3) *Online video is visual data,* making it particularly appropriate material for measurement by computer automated image analysis that then visualizes cultural patterns and change.

4) *Online video is today's real-time cultural data*. Online video-sharing sites are updated in real-time, on a potentially global scale. Exploring this growth is a key first step to any comprehension or analysis of the continuously unfolding present.

5) What might be the challenging theoretical questions posed by new cultural medium of online video? Well, these are what Cultural Analytics provides the opportunity to explore.

Techniques: How to do Cultural Analytics
Obtain a large body of cultural data. Clean data is important. Now, you can begin the process of 'analytic browsing' and, I would add, analytic insight – that is, the kind of exploration and awareness that leads to understanding. The techniques for doing Cultural Analytics can be divided into two categories:[8] *direct visualization* and *digital image analysis alongside visualization of content.*

The dataset can be *directly visualized*, without additional computational analysis, by sampling or remapping existing visual data and its accompanying metadata – creation date, length of clip, keywords, category and so on. For example, if we apply this method to online video, we might take all the clips posted to YouTube on a given day and graphically organize them according to length, location, channel, and so on. Or, we might take a representation of the actual media content in the form of sampled frame, and re-order them to visualize content in a new or distilled form (a montage of all frames, a series of frame slices, or a single frame summary of regularly sampled frames).[9] Figure 1 shows diagrams of two direct visualization techniques that are useful for analyzing video. Although these techniques may appear very simple, their ability to consolidate potentially hours of video content into a single image often leads to fruitful and original discoveries that may have remained hidden if video clips are only viewed one frame at a time, in sequential form.

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[8]   Lev Manovich, 'Visualization Methods for Media Studies' in *Oxford Handbook of Sound and Image in Digital Media*, ed. Carol Vernallis (forthcoming).

[9]   Brendan Dawes' *Cinema Redux* (2004) is an example of the montage method of direct visualization whereby an entire film is distilled down to a single image. See: http://processing.org/exhibition/works/redux/index.html.

Figure 1. Direct Visualization Techniques for Video.

Figure 1a. Montage Technique.
This technique involves sampling frames from a video clip and arranging these frames in a rectangular grid according to their original sequence. In this diagram, each numbered square represents a hypothetical frame sampled from a video. (The video on the left has 20 sampled frames; the video on the right has 17). Such re-mapping allows you to see the patterns in form and content across a video's entire duration in a single glance. This technique is particularly useful for comparing multiple videos at once.
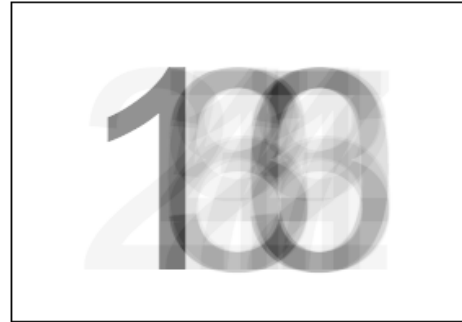
Figure 1b. 'Summary Image' Technique.
This technique involves sampling frames from a video clip and then superimposing these frames on top of each other to create a single 'summary image'. If visual elements remain clearly discernible within the summary image, this means that they stayed in the same position for a significant portion of the clip. If the summary image appears uniformly blurred in color and texture, this is a likely indication that the visual elements in the original video constantly moved or changed.

Alternatively, we can *add the step of digital image analysis* and *visualize the results alongside the media content*. This allows us to explore the patterns in videos along potentially hundreds of visual dimensions: brightness, saturation, color and pixel difference between frames are just a few variables that are relevant to a study of online video. Imagine a visualization that reveals whether any of these measures change over the duration of a clip, or the duration of successive video responses to a video clip, or between content posted by professionals and by amateurs? The list of what such visualizations hold the potential to reveal is as endless as the possible combinations of visual characteristics.

A Sample Set: Using Culture Analytics To Re-present 2008 U.S. Presidential Campaign Ads
The pilot study chosen to test a Cultural Analytic approach to online video explores a small sample set, composed of advertisements produced by the Barack Obama and John McCain campaigns during the 2008 U.S. presidential race (see Table 1).[10]

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[10]   Video clips of all advertisements in the sample are available on YouTube at the specified URLs. Further information included credits, original airdate and transcripts is available from *The Living Room Candidate* (http://www.livingroomcandidate.org), an online archive of presidential campaign commercials 1952-2008 organized by the Museum of the Moving Image.

TABLE 1. Sample Set of 2008 U.S. Presidential Campaign Ads.

OBAMA	TV	D1.	"No Maverick"	http://www.youtube.com/watch?v=NBtbG5xjFBY
		D2.	"Something"	http://www.youtube.com/watch?v=qxbGPDIVlNM
		D3.	"Spending Spree"	http://www.youtube.com/watch?v=qwupV_02UOY&p=D8B82AAE571F72EF&playnext=1&index=27
		D4.	"This Year"	http://www.youtube.com/watch?v=Y42RErUjfAc
	WEB	D5.	"Al the Shoe Salesman Gets a Tax Cut"	http://www.youtube.com/watch?v=99HzP6BQm5Y
		D6.	"Proud of That Commercial"	http://www.youtube.com/watch?v=x5VaA6sMabk

MCCAIN	TV	R1.	"2013"	http://www.youtube.com/watch?v=tB3BNgdfEkI
		R2.	"Broken"	http://www.youtube.com/watch?v=yIJkmMR8Fek
		R3.	"Celeb"	http://www.youtube.com/watch?v=oHXYsw_ZDXg
		R4.	"Special"	http://www.youtube.com/watch?v=E08opP-qnQM
	WEB	R5.	"Dr. No"	http://www.youtube.com/watch?v=a3Zy50Dy6Zk
		R6.	"Strong"	http://www.youtube.com/watch?v=VVB5rd-azXM

Title and URLs for each of the 12 campaign ads analysed. Eight ads (four Obama and four McCain) were aired on television and distributed on the web. Four ads (two Obama and two McCain) were aired exclusively online. All ads in the sample were officially produced and made available by the campaigns with the exception of D6, which was produced by the Democratic National Committee.

The videos in the set include eight advertisements produced for television and also disseminated on the web, and four advertisements produced solely to be aired on the web. As a group, the clips run for a total of 413 seconds, and sampled at 12 fps, provided 4,960 frames for analysis. Since the goal of the study was to test the Cultural Analytics methods when applied to online video, the dataset is preliminary in size and in exploration, and thus not yet scaled to the magnitude of the larger datasets that characterize more developed Cultural Analytics projects[11] or the full potential of what the approach has to offer an analysis of the 2008 U.S. presidential campaign ads. However, before beginning to gather, process and analyse vast amounts of data, it makes sense to play small, and scale up should the exploration of data prove interesting. It does.
The Context of the 2008 U.S. Presidential Campaigns

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[11]   See the Software Studies website (softwarestudies.com) and Flickr stream (http://www.flickr.com/photos/culturevis) for examples of projects with significantly larger datasets (up to one million individual images) and more in-depth statistical analysis.

To say that the 2008 presidential campaign was an historic one is an understatement. Not only did the end result of electing the nation's first African American president change the game of American presidential politics, the build-up was equally revolutionary: the 2008 election cycle marked the first time both candidates were sitting U.S. senators; the longest campaign with the greatest gap between nominations and primaries; a record number of votes cast (131.2 million);[12] and the most expensive campaign in U.S. presidential history, with $745.7 million spent by Obama and $350.1 million spent by McCain.[13]

Equally notable was the candidates' use of the internet and Web 2.0 technologies. Although both Obama and McCain relied on today's wired and networked landscape to organize, advertise and communicate with their constituents, the Obama campaign is seen as the overall winner, with impressive results. At the 2008 Web 2.0 Summit shortly following the November elections, Arianna Huffington went as far as to assert that, 'Were it not for the Internet, Barack Obama would not be president. Were it not for the Internet, Barack Obama would not have been the nominee'.[14]

The implications for the way that presidential campaigns are run are profound. In 2008, the web became the complementary medium to broadcast television for political advertising. Since the middle of the 20th century, broadcast media had been the major factor at play in the media campaigns of the respective parties.[15] Until 2008, broadcast political advertisements had no significant online presence in any prior U.S. presidential campaigns for obvious reasons: YouTube and other online video-sharing sites simply weren't around yet. The introduction of online video to the political campaign advertising repertoire in the 2008 presidential elections opened up a vast arena for communicating and receiving political messages.

For one, using online video for advertising is cost-effective. Advertisements designed for broadcast on television can also be posted to the web and thus aired to a potentially larger portion of the population for a greater length of time. Advertisements can also be designed purely for web distribution, which cuts expenses significantly. The official material created for the Obama campaign that was posted on YouTube was viewed for a total of 14.5 million hours. To buy this much time for broadcast on television would cost $47 million.[16] On YouTube, this expense is reduced to production costs, plus any costs for storage and streaming, which are currently minimal in comparison. It is worth

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[12] Federal Election Commission, '2008 Official Presidential General Election Results,' 4 November, 2008, http://www.fec.gov/pubrec/fe2008/federalelections2008.shtml.

[13] Federal Election Commission, 'Overview of Presidential Financial Activity 1996 - 2008,' 2008 Presidential Campaign Financial Activity Summarized, Press Release, 8 June, 2009, http://www.fec.gov/press/press2009/20090608PresStat.shtml.

[14] Claire Miller, 'How Obama's Internet Campaign Changed Politics,' NY Times Bits blog, 7 November, 2008, http://bits.blogs.nytimes.com/2008/11/07/how-obamas-internet-campaign-changed-politics.

[15] Lynda Lee Kaid, 'Videostyle in the 2008 Presidential Advertising,' in Robert Denton and Robert E. Denton Jr. (eds) *The 2008 Presidential Campaign: A Communication Perspective*, Plymouth, United Kingdom: Rowman & Littlefield Publishers, 2009, p. 209.

[16] Miller, 'How Obama's Internet Campaign Changed Politics.'

noting that the use of online video also enables mass distribution of unofficial campaign material or negative advertising produced by the public. For the purposes of this sample study, however, we will be interested only in the official content created for the campaigns.

Given the historical importance of broadcast advertising as a communication tool in presidential campaigns, and the noted innovation of the 2008 U.S. presidential campaigns in embracing the web as a medium of communication, what are the aesthetic, cultural and political affects/effects of the use of online video for political advertising? How is cultural change manifest in online video – for example, does the use of online video for political advertisement result in changes to video style? Does it alter visual and/or political rhetoric? What about practices of reception? We can put forward hypothetical responses to these questions. Sometimes we can even 'sense' them. Cultural Analytics lets us trace and comprehend them.

Sample Set Visualizations
When we watch a political advertisement, we watch a series of moving image frames that change over the course of the video's duration. Each frame has a set of unique visual characteristics that we parse in succession, but always one frame at a time. Political remix videos allow us to see this succession in an alternate, or subverted, order. Yet, even if we change the order of succession, we still have no way to see the precise patterns in visual characteristics as they extend temporally over the duration of the clip. Perhaps we can mentally construct this representation for one 30 second commercial, but what if we want to compare such patterns across multiple commercials?

The line graphs in Figure 2 offer one possible way of achieving this, by visualizing simple but effective representations of a dimension of video that we can call 'visual change'. This includes the types of change commonly discussed in film and video production and theory, such as camera movement, shot types, and other cinematic techniques, as well as the graphical changes that became commonplace in the 1990s with the adoption of motion graphics and compositing software such as Adobe After Effects.

Using digital image analysis and simple software, we can measure the pixel difference between two consecutive frames, where pixel difference is a function of how many pixels change from one frame to another. The measurement can then be plotted in the form of a line that, like a seismograph printout, graphically displays the rhythm of visual change over time. A large spike marks a greater magnitude of difference between two frames and is a likely indicator of pronounced movement across a frame. This difference might correspond to a cut, a movement of the camera, characters, animated text, or graphics, or any other variety of visual change.

FIGURE 2. Comparison of Movement for Obama and McCain Web and TV Ads.
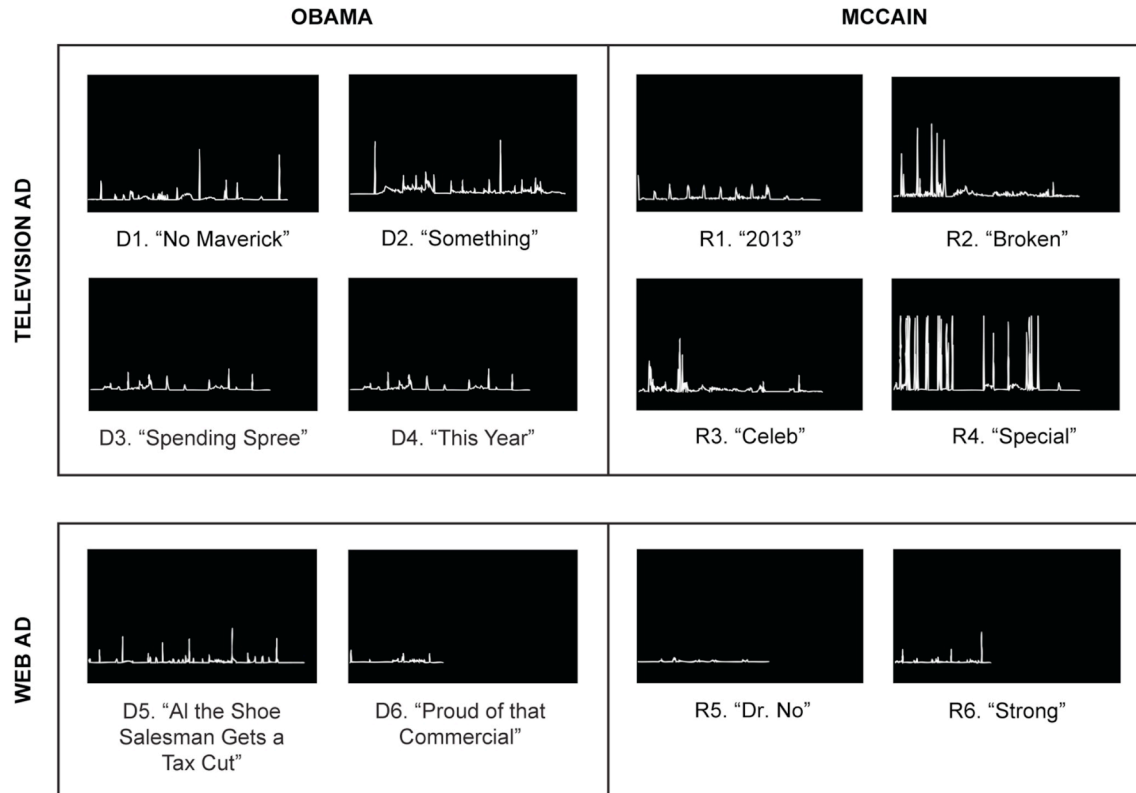
Frame Difference Line Graphs for each of the 12 ads in the sample set.
x-axis: frame number
y-axis: frame difference

Viewing these frame difference line graphs as a group allows us to see interesting broader patterns, namely:

1) *Web commercials are more static than commercials made for television.* As the line graphs immediately reveal, the web commercials have a lower frequency and magnitude of visual change.[17]

2) *McCain's television ads are more visually dynamic.* The line graphs for McCain's television ads spike more often and with greater intensity than those produced by the Obama campaign.

These two levels of visual difference discovered in the data appear in other dimensions of video style that, unlike movement, may be a bit more difficult to intuitively perceive when watching a moving image. Since images can be measured by a computer on

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[17]   'Summary images' are not included here but can accessed at the through the link referenced at the beginning of this paper.

hundreds of different visual characteristics, we can combine any two of these dimensions to create a kind of 'image map' – a 2D visualization that incorporates a combination of these measurements to diagrammatically represent the visual form of the image(s) analyzed. Figures 3 and 4 show image maps that take regularly sampled frames (at 12 fps) from all of the ads and represent them together on two dimensions.
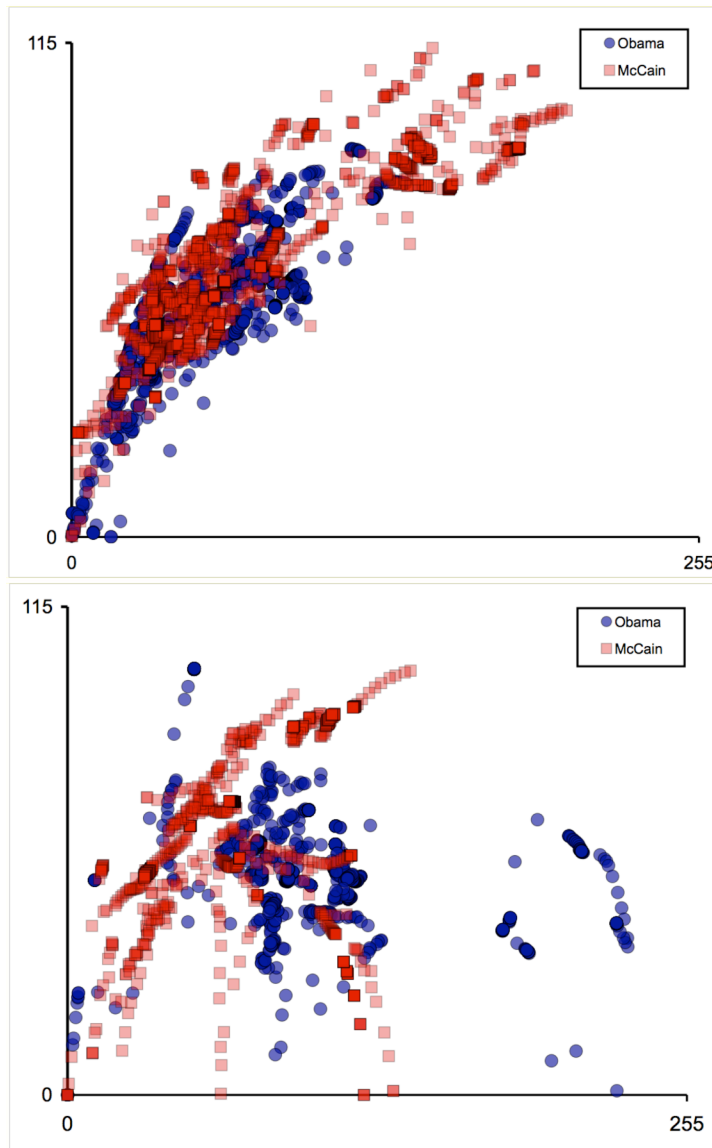
FIGURE 3. Comparison of Web and TV Ads.

Figure 3a.
2008 U.S. Presidential TV Ads.
x-axis: A mean for all pixels' grayscale values in single frame.
y-axis: A mean of standard deviation of pixels' grayscale values in single frame.

Figure 3b.
2008 U.S. Presidential Web Ads.
x-axis: A mean for all pixels' grayscale values in single frame.
y-axis: A mean of standard deviation of pixels' grayscale values in single frame.

In Figure 3, the mean (average) grayscale values of all video frames are mapped against the standard deviation of these values. In other words, the x-axis represents the average brightness of an image, while the y-axis represents the range of all grey tones in an image, so that each point on the graph marks the intersection of these two

measurements. Again, we can use simple digital image analysis to measure these visual characteristics, but what can a comparison of the numbers reveal?

The range of a binary grayscale is 0-255 where 0 is pure black, 255 is pure white and all values in-between are different intensities, or shades of grey. The further to the right of the graph a frame falls, the lighter the average value of the pixels comprising the image. Standard deviation – the value that dictates where a point falls on the vertical dimension in these graphs – is simply a measure of variability that shows how different a value is from the average. So, those data points towards the bottom of the graph could be said to refer to frames that have fairly typical (or expected) grayscale values whereas those data points at the top of the graph refer to frames where the intensity is further removed from the norm. Immediately, we notice a difference between Obama and McCain, and between web and television, as to where the frames fall along both the horizontal and vertical dimension. The distribution of frames drawn from television advertisements falls close to a clear trend line. There seems to be some normative combination of mean grayscale value and standard deviation that characterizes the ads designed for television broadcast. The web advertisements, however, are scattered, with no apparent core. Perhaps this is an indication that political campaign web ads do not yet have a normative visual language? This is not a hypothesis that can be tested with the small sample set gathered for the purposes of this pilot project, but it is certainly worth looking into.

Analysis using the techniques of Cultural Analytics can lead us to ask questions that are sometimes old, sometimes new, and sometimes reveal the old in a new light. The distribution of frames drawn from the television advertisements – that is, advertisements with a history of visual development – have a distinct core. There seems to be a pattern to the numbers. To make the visual characteristics behind these numbers a little easier to see, we can add the frames being analysed directly into the graph.

Figure 4 takes the image analysis data used in Fig. 3a to graph a comparison between McCain and Obama TV ads, breaks the dataset into two visualizations, and maps the image content with the analysis. The variance in visual style becomes almost immediately perceptible. The frame cluster in the top right corner of the graphs depicting McCain's television advertisements corresponds to uncharacteristically white frames that deviate significantly from the representative mean value characteristic of the majority of all frames (both Obama and McCain) that comprise the dataset. Here again, Cultural Analytics leads us to further avenues for exploration. What other visual dimensions, besides mean grayscale value and standard deviation, might contribute to the strong core we observe in the television-based campaign advertisements? Brightness? Color? Saturation? And what exactly is unique about this outlying subset of frames that fall at the extreme edges of this core?

FIGURE 4. Image Map Comparison of Obama and McCain TV Ads
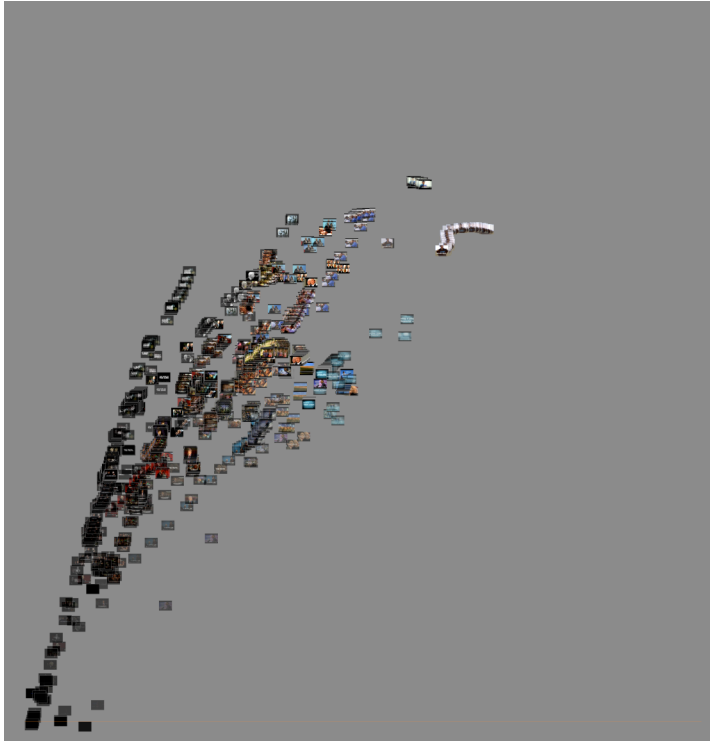
Figure 4a.
2008 Obama TV Ads.
x-axis: A mean for all pixels' grayscale values in single frame.
y-axis: A mean of standard deviation of pixels' grayscale values in single frame.
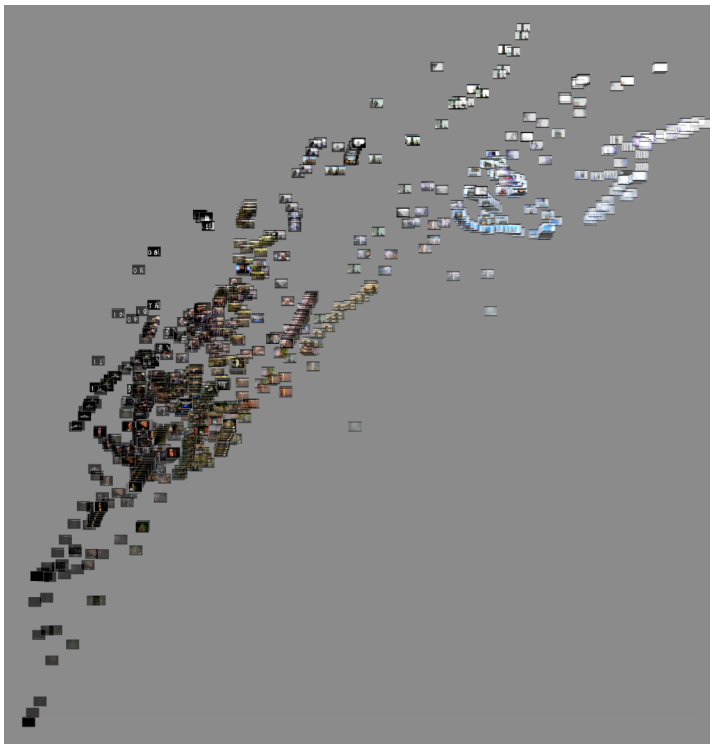
Figure 4b.
2008 McCain TV Ads.
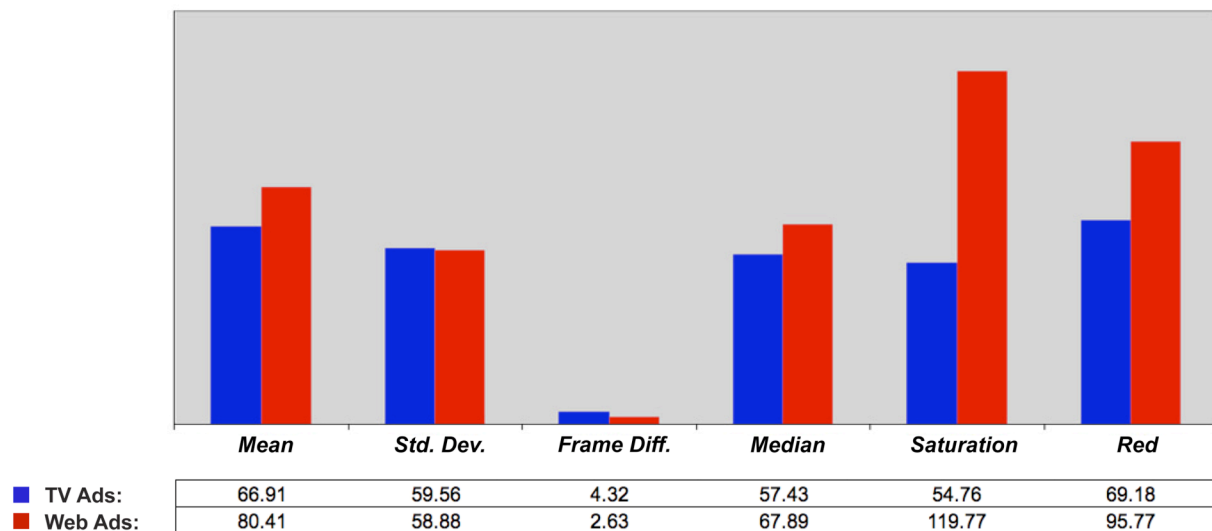x-axis: A mean for all pixels' grayscale values in single frame.
y-axis: A mean of standard deviation of pixels' grayscale values in single frame.

What Cultural Analytics Tells Us About the 2008 U.S. Presidential Campaign Ads
Notice that the patterns that continue to emerge from the visualizations are related. If we compare patterns across a larger number of visual characteristics and condense our image analysis to sample-wide averages (Fig. 5 – 6), keeping in mind the comparatively detailed explorations discussed thus far, we can observe general trends in the visual form of the campaign advertisements across multiple dimensions of measurement:

1) While all campaign ads in the sample set were posted and distributed on the web, those *ads designed for television broadcast are visually different than ads designed for web broadcast across a number of visual dimensions.*
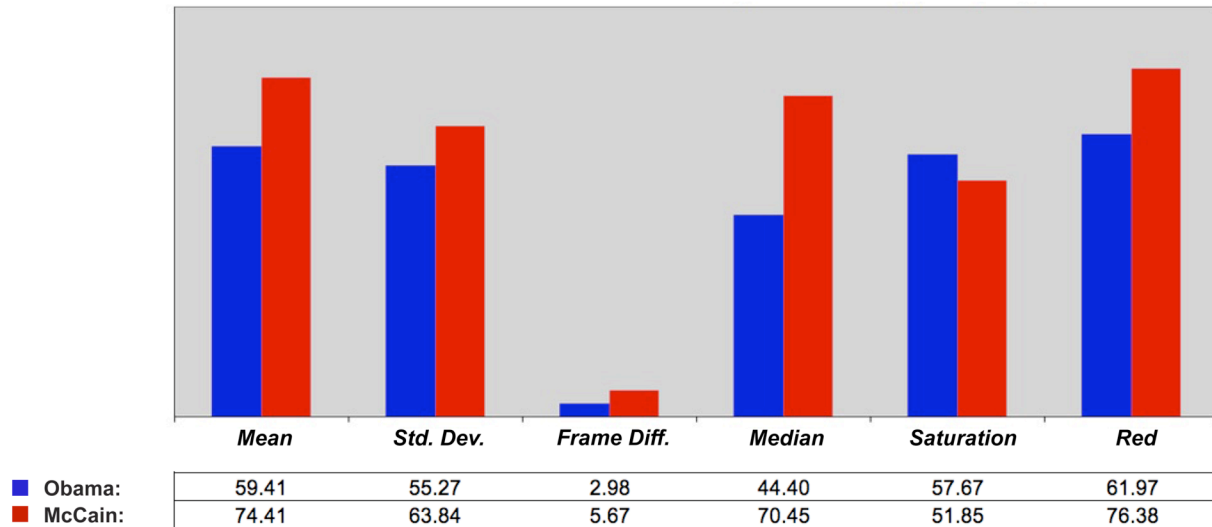
FIGURE 5. Visual Dimension Averages for 2008 U.S. Presidential Campaign Ads (TV vs. Web).

	Mean	*Std. Dev.*	*Frame Diff.*	*Median*	*Saturation*	*Red*
■ TV Ads:	66.91	59.56	4.32	57.43	54.76	69.18
■ Web Ads:	80.41	58.88	2.63	67.89	119.77	95.77

If the internet was indeed a revolutionary force in the 2008 U.S. presidential elections, then we might expect to see this reflected in the visual design of campaign advertising and communication. As the numbers reveal, we do. For all but one of the six visual characteristics represented in Figure 5, there is a measurable difference between television and web advertisements. However, the implications and parameters of the patterns that emerge from the data may deviate from our expectations about how the developing medium of online video should look and function. The pattern revealed – that web-based advertisements possess a quieter and more conservative visual language that those designed for television – is not a trend we would expect from the 2008 U.S. presidential campaign's innovative use of an online moving-image medium.

2) Comparing the television advertisements for both candidates leads to a similarly counterintuitive observation: *McCain's TV ads are more visually aggressive and radical in visual language than Obama's*.

FIGURE 6. Visual Dimension Averages for 2008 U.S. Presidential Campaign TV Ads (Obama vs. McCain).

	Mean	Std. Dev.	Frame Diff.	Median	Saturation	Red
Obama:	59.41	55.27	2.98	44.40	57.67	61.97
McCain:	74.41	63.84	5.67	70.45	51.85	76.38

Here again, the results of digital image analysis challenge our prior assumptions. Based on the political rhetoric, public opinion and party lines surrounding the candidates, we might expect that the media team for Obama, the younger and ostensibly more 'dynamic' candidate, might design commercial advertisements that showcase this dynamism. Yet, the visualizations I have presented indicate otherwise. At least for the small-scale sample set of this study, John McCain's television advertisements are comparatively more visually radical than Obama's. Could McCain be putting forward a 'maverick' political message in response to Obama's message of 'change?' Why is this pattern visible in advertisements produced for television and not those produced for the web? If we're interested in a real-time critical theory of online video, these questions are worth pursuing.

These observations are based on visualizations that explore just a few of many possible dimensions of the visual language available for political video advertisements. Analysing different characteristics, and combinations of these characteristics, may reveal different degrees of disparity. Furthermore, a more in-depth analysis of a larger dataset across a longer era of time may offer further insight into the changing form of the broadcast campaign advertisement. Fortunately, Cultural Analytics scales up to the macro-level. Imagine visualizing *all* U.S. presidential campaign advertisements, from their birth during the 1952 Eisenhower vs. Truman presidential race up until the present, and watching the unfolding of a media form over decades. Imagine extending this analysis beyond a single election cycle, so as to compare and observe how the introduction of an

online video medium might have changed the visual language of political campaign advertisements. Imagine incorporating the unofficial online advertisements and video responses into the dataset. Imagine leaving the U.S. and analysing political campaign ads as they venture into the new web medium on a global scale.

Such visualizations would allow us to explore cultural dynamics as it happens, in real-time. Cultural Analytics lets us observe, with the support of quantitative analysis, what characterizes today's campaign advertisements in relation to those of the past. With observation, we can then ask: Does the visual style of web and television advertisements differ more significantly than the style of campaign advertisements broadcast in different election years? Is the visual rhetoric of a campaign correlated to a candidate's political leaning or to a given culture's visual ideals? Does the visual language of political campaigns translate globally and if so, does it flow with shifts in global politics? Most importantly, Cultural Analytics has the potential to help us ask these questions and even uncover new questions, which we may never have otherwise thought to ask.

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References

Burgess, Jean. '"All Your Chocolate Rain Are Belong to Us?" Viral Video, YouTube and the Dynamics of Participatory Culture,' in Geert Lovink and Sabine Niederer (eds) *Video Vortex Reader: Responses to YouTube*, Amsterdam: Institute of Network Cultures, 2008, pp. 101-110, http://networkcultures.org/wpmu/portal/files/2008/10/vv_reader_small.pdf.

Federal Election Commission. '2008 Official Presidential General Election Results,' 4 November, 2008, http://www.fec.gov/pubrec/fe2008/federalelections2008.shtml.

Federal Election Commission. 'Overview of Presidential Financial Activity 1996 - 2008,' 2008 Presidential Campaign Financial Activity Summarized, Press Release, 8 June, 2009, http://www.fec.gov/press/press2009/20090608PresStat.shtml.

Jenkins, Henry. 'Slash Me, Mash Me, Spread Me...,' Confessions of an Aca/Fan, Henry Jenkins blog, 24 April, 2007, http://www.henryjenkins.org/2007/04/slash_me_mash_me_but_please_sp.html.

Kaid, Lynda Lee. 'Videostyle in the 2008 Presidential Advertising,' in Robert Denton and Robert E. Denton Jr. (eds) *The 2008 Presidential Campaign: A Communication Perspective*, Plymouth, United Kingdom: Rowman & Littlefield Publishers, 2009, pp. 209-227.

Lovink, Geert. 'The Art of Watching Databases – Introduction to the Video Vortex Reader,' in Geert Lovink and Sabine Niederer (eds) *Video Vortex Reader: Responses to YouTube*, Amsterdam: Institute of Network Cultures, 2008, pp. 9-12, http://networkcultures.org/wpmu/portal/files/2008/10/vv_reader_small.pdf.

Manovich, Lev and Wardrip-Fuin, Noah. 'Cultural Analytics: white paper,' (May 2007, latest update November 2008), http://lab.softwarestudies.com/2008/09/cultural-analytics.html.

Manovich, Lev. 'Visualization Methods for Media Studies' in Carol Vernallis (ed) *Oxford Handbook of Sound and Image in Digital Media* (forthcoming).

Miller, Claire. 'How Obama's Internet Campaign Changed Politics,' NY Times Bits blog, 7 November, 2008, http://bits.blogs.nytimes.com/2008/11/07/how-obamas-internet-campaignchanged-politics.