On Hyper-locality: Performances of Place in Social Media

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Abstract

In this paper we theorize, visualize, and analyze the relation between physical places and their social media representations, and describe the characteristics of hyper-locality in social media. While the term "hyper-local" has been recently used to describe social media that is produced in particular locations and time periods, existing research has not raised important questions about representation and experience. How is the physical place performed through social media data? How do we experience locality via social media platforms?

Our work combines quantitative and qualitative analysis, and employs perspectives from the fields of Digital Humanities and Art History that have yet to be used in social media research. We offer a theory of hyper-local social media, and theorize its manifestations and operations using a particular case study.

We start by historicizing the hyper-local, drawing parallels between conceptualizations of "site-specific" artworks created in the 1970s and current organization of geo-temporal social media images. Next, we exemplify the hyper-local using the case study of the famous street artist Banksy's month-long residency in NYC during October 2013. We analyze and visualize 28,419 Instagram photos of these artworks to explore how these photos represent space and time specific events, as well as add new meanings to Banksy's original images. Finally, we offer a theoretical analysis, proposing what we see as some of the key characterizations of hyper-local social media data.

Introduction

The production, organization, presentation, and analysis of social media data have recently been described in terms of its "hyper-locality" (Hu, Farnham, and Monroy-Hernández 2013): the association of an information atom (check-in, a tweet, a photograph) with a specific time and place. This description, however, does not address the ways in which we experience this hyper-locality over social media platforms. How is the physical place represented via the lens of social media data? How can we describe the unique aspects of this locality? In this paper we theorize, visualize, and analyze the relation between physical places and their social media representations, and propose the key characteristics of hyper-local social media data.

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Our work combines quantitative and qualitative approaches. We also employ perspectives from Digital Humanities and Art History which until now have not been used in social media research. We historicize the cultural origins of hyper-locality, analyze its characterizations and operations within current social media platforms, and use visualization to explore an important example of hyper-local media production.

The analysis of hyper-locality offered here uses visual social media. We suggest that geographical and temporal tagged images shared using social media platforms are a realization of artistic neo avant-garde ideas from the late 1960s. While Modernist art objects were detached from the context of the place and time in which they were presented, later neo avant-garde groups proclaimed the importance of an artwork's "site-specificity," where the object could only exist and be defined by the context of its particular time and place.

Based on this historical parallel we offer a theory of hyper-local social media. We proposes that contemporary hyper-local media has three key characteristics: **fragmentation**, **temporalization**, and **nomadicity**.

Finally, we illustrate, visualize, and analyze these hyper-local characteristics using a particular case study. During October 2013, the famous street artist Banksy produced a different work for nearly each day (29 in total) in various locations around New York City. We use a dataset of 28,419 Instagram photos annotated with the hashtags #banksy and #banksyny and examine how these photos represent Banksy's artistic actions in specific spaces and times.

Background

Hyper-locality has recently gained popularity as a term that describes a wide range of meanings. Most often, it is mentioned in the context of the news media's increasing ability to provide information in highly targeted geographic niches (Jarvis 2009; Miel and Faris 2008). In this context, it refers to information that originates from organized online communities or individuals such as bloggers (Metzgar, Kurpius, and Rowley 2011), or from user-generated social media that is automatically augmented with location information and time stamp (Hu, Farnham, and Monroy-Hernández 2013;

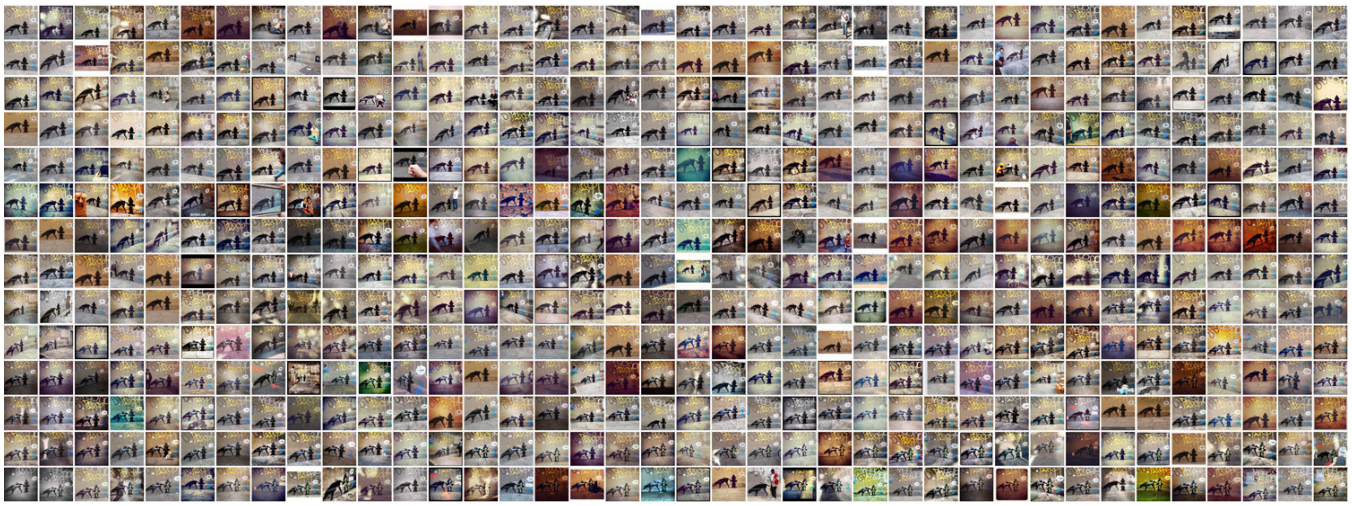

Figure 1: Montage visualization of Instagram photos from cluster 2 organized by time from top left to bottom right

Ewart 2013).

Existing research touches upon various aspects of hyper-locality, and offers conceptual and analytical tools for the study of its socio-cultural aspects. Wilken and Goggin, for example, offer a comprehensive account for the ways in which place and mobile technologies intersect and interact (Wilken and Goggin 2012). Gordon and de Souza e Silva (2011) provide a useful discussion of the socio-cultural effects of "networked locality" (Gordon and de Souza e Silva 2011). In an earlier work, Dourish points to ways new technologies produce alternative spatialities and appropriate existing places in new ways (Dourish 2006).

However, none of these studies agree on the definition of hyper-locality, or propose concrete characteristics of hyper-local social media. Identifying a similar shortcoming, Metzgar et al. (2011) attempted to define the hyper-local, but their definition only refers to geographically specific communities and organization of news reporting over the web neglecting the ways in which different aspects of hyper-locality manifest themselves in social media.

Computer scientists offer an ever increasing number of studies of hyper-local social media data (Cranshaw et al. 2012; Xie et al. 2013). However, while exceptional few examples for the study of the particularities of a place via social media data do exist (Winter, Kuhn, and Krüger 2009), the majority of this research is devoted to the study of the relation between groups of places, typically applying clustering or other methods in order to analyze social similarity between different geographical locations (ElGindy and Abdelmoty 2012; Zhang et al. 2013). The results are homogeneous clusters of fixed entities that erase the particularity of a singular place, neglecting the dynamic, temporal aspects in favor of aggregation and categorization with other similar "types" of places (i.e. areas frequented by locals vs. tourists; or defining the boundaries of a city based on clusters of places people attend frequently). Put differently, existing computational research typically looks for geographical homogeneity and neglects the heterogeneity of physical places as these are seen through the lens of hyper-local social media data. In doing so, it does not try to find ways to trace and analyze the particularity of unique singular places as they are represented in social media.

In summary, the limitations of current work on the hyper-local is the lack of consensus in regard to the definition and meaning of hyper-locality on social media, together with the lack of attention paid by computational research for the study of the unique expressions of this locality in specific places. Addressing these shortcomings, we offer a theoretical discussion of the unique performances and exhibitions of a place (Hogan 2010) in social media data. Specifically, we consider the following questions. How is the organization and presentation of hyper-local visual social media manifests distinct modes of interactions with physical experiences? How it intensifies particular aspects of place and time compared to their presentations via other types of data? What are the relation between physical places and their social media hyper-local representations?

From the Spiral Jetty to the Streets of NYC

Answering these questions requires that we pay attention to the material conditions of hyper-local social media data (i.e. how it is structured, represented, etc.).

The question of the form of information and how it enables particular exhibitions or performances of our world has a long research tradition. This research has looked at the structure of technological and cultural objects and how they might reflect particular values and hierarchies in time and place (Dourish and Mazmanian 2013; Manovich 2013; Goody 1977; Ong 1982; Panofsky 1991). In our case, we are interested in particular aspects of the materiality of information: the ways in which hyper-local visual information within social media platforms is structured, and how these hyper-local visual forms influence our understanding of local events and places.

The ways in which visual data on the Internet is organized, retrieved and analyzed can be roughly divided into

two main opposing informational modes. Within social media platforms, images are annotated with geographical and temporal metadata, and are organized by upload time (typically this is the default representation) or by location (either on a personal photo map or collectively showing all images tagged to a place).

The second organizational mode on the Internet today "strips away" images from their original source page. Instead, images are presented with countless other images that are similar in some ways (such as search term, user tags, colors, etc.). The most prominent service that uses this informational mode is Google Image Search. After a January 2013 update, Google started displaying images with no direct connection to the original web pages in which they appeared, and the source page no longer loads up in an iframe in the background of the image detail view. (Wikipedia 2014a)

We will call these two organizational modes: "native" and "nomadic." In the nomadic mode, images are organized without any direct connections to their origins (i.e., Google Image Search which presents images together as a single never ending collection, without direct references to their sources). In contrast, in the native mode, social media images are presented as a data stream organized by their upload time and specific location and time (i.e., Instagram Timeline). What are some of the possible histories of these two types of organizational forms of visual materials? And what do these historical traces of similar visual informational understandings can tell us about the current structure and experience of hyper-local images? We believe that the tension between the nomadic and native informational modes used to present images is not new. For example, if we look at the history of modern art, we can find similar modes. The first corresponds to earlier conceptualization of visual materials in modern art; the second corresponds to a "site specific" artistic practice which emerged in late 1960s.

Modernist artists saw a visual art object as a thing in itself, which was not affected by the time and place in which it was presented. The spatial organization of the visual object was not supposed to affect the meaning and understanding of this object, and thus the white neutral museums walls were the ultimate venue for their presentation. The work was designed for the "white cube" - an exhibition interface which could be located anywhere. Turning against this notion, starting in the late 1960s neo avant-garde groups (specifically, artists creating happenings, performances, and site-specific works) offered completely oppositional understanding of the visual object. They emphasized how the meaning of the artistic object is derived from the particularities of its organization in time and space.

These avant-garde groups aimed to relocate the meaning of the visual from what was going on inside it, to everything that is going on outside of this object: To turn our attention from within the art object to the contingencies of its context; to shift Modernist understanding of the visual as independent from time and space towards a more sensorial, phenomenological understanding of lived bodily experiences around that visual object. In short: to re-attach the visual to a particular time and site.

In this new paradigm, a site was conceived as a unique combination of physical dimensions (such as depth, length, height, temperature, etc.), and the visual object was created specifically to relate to, reflect upon, and exists within these dimensions (Kwon 1997). One of the most famous examples of these new relations between the particularities of a place and the visual art object is Robert Smithson's Spiral Jetty (see Figure 2). To create this 1970 "sculpture" located on the northeastern shore of the Great Salt Lake, the artist used local mud, salt crystals, rocks, and water. The result was a 1,500 foot long and 15-foot wide counter clockwise coil jutting from the shore of the lake.(Wikipedia 2014b)

Figure 2: Robert Smithson, Spiral Jetty (1970), sculpture. Rozel Point, Great Salt Lake, Utah

As apposed to Modernist art objects (such as abstract paintings by Mondrian or Malevich) that were portable, nomadic, and could moved from one museum space to another–and as such were "timeless," "placeless," and detached from any relations to their original time and place of creation–Spiral Jetty emphasizes the dimension of time, and the particular material condition of its place (the visibility of the sculpture depends on the water level of the Great Salt Lake). In the words of Smithson himself, it is "an emblem of [the] transience" (Morris 2003) of a particular place, and a manifestation of a particular time-place relationships.

In this sense, we can think of the contemporary geo-temporal digital image (the image which has spatial coordinates and a time stamp) as a new realization of this neo avant-garde concept. It actualizes their aspirations to turn the visual into an "attachment" to an actual site in order to capture lived, timely experiences. The meaning of the visual is now rooted to its context, attached to its specific time and place. In other words, the neo-avant-garde desire to understand a visual object as a "place attachment" (Low and Altman 1992) and as a sensorial experience has been realized with the geo-temporal image in two ways: First, the visual itself is now ingrained in specific time and place. Second, the image itself is a manifestation of a particular, fleeting, unrepeatable experience of that place.

We can also describe these new relations in a different

way. If the modern, "nomadic" visual forms saw the image as "noun/object" to be experienced in complete detachment from its place (i.e. the outside material conditions of the place and time of it presentation should not affect its meaning) the "native" realization of the visual object within a particular site by the neo avant-garde of the 1970s turned it into a "verb/process" that is all about the relations of the visual object to its surroundings in particular times (Kwon 1997).

These latter types of relations between a visual object and its location are realized and amplified in social media geo-referenced activities. Through the lens of the multitude of visual and textual hyper-local activities, a physical site is no longer viewed as a fixed spatial entity (noun/object) but rather as a set of "functions" (verb/process): the overlap of text/tweets, photos, videos, physical places and things within this site and their connection to other functions within different sites.

What are then the terms under which these functional sites exist and represented? What performances or functions of a place are manifested via its hyper-local social media data? In the following section we analyze the conditions under which social media hyper-locality is experienced, and illustrate them using a particular case study.

Following Banksy

During the month of October 2013, the famous anonymous British street artist Banksy conducted a month long "residency" in the streets of New York City, titled "Better Out Than In". Nearly every day of this month, Banksy installed a new work in a different location in the city (typically it was an image stenciled on a wall). Each new piece was announced on a website specially created by Banksy for this project (banksyny.com), and the information about its particular location in one of New York's five boroughs spread virally. The artist himself posted a photograph of the work created each day on Instagram, and asked his followers to post other photos of the work with the hashtag #banksyny. In many cases, the only way to detect the location of the physical works was to search for their earlier representations online, posted via the #banksyny hashtag. In return, residents and visitors to the city flocked around the city's boroughs in an effort to catch a glimpse of Banksy's works before they disappeared, or were defaced or painted over (Smith 2013).

The result of Banksy's residency in NYC was a continuous, month long series of dispersed real-life and online events that mirrored each other. As such, photos and other social media data taken and shared during that month played an integral role within Banksy's well-rehearsed and thought out artistic investigation: examining the relations between a site and its logic of reproducibility in social media platforms. In his month long series of daily works, Banksy examined the ways in which the physical place marked by him is communicated via social media platforms. In order to examine this logic of reproducibility we analyze a set of photos taken, shared and tagged to Banksy's month of residency in NYC.

In the following, first we describe our dataset and methods. Next, we visualize temporal, spatial and semantic patterns within our dataset. Finally, based on our results, we propose some key characterizations of hyper-local social media data.

Data

Using Instagram's API, we crawled Instagram photos and their metadata (user ID, latitude and longitude, comments, number of likes, date and timestamp, type of filter applied, and user–assigned tags) to find all publicly available photos with tags #banksy and #banksyny. We then created our data set by filtering these photos in the following way. We chose photos with the tag #banksyny shared from October 1st, 2013 until November 20, 2013. For photos with the tag #banksy, we included only the ones from October 2013 geotagged to NYC area. Since there was some overlap between these two sets, only one copy of each image was included. After this filtering our final data set has a total 28,419 photos (18,533 photos tagged #banksyny, and 9,886 photos tagged #banksy).

Methods

Our assumption was that the dataset includes multiple photos of the same artwork taken by different people. We used a two-step method involving computer vision techniques to find all photos documenting the same artwork by Banksy. We first identified clusters of photos that represent the same work, and then used these clusters to train a classifier to find more images of the same work.

There are numerous features that can be used to represent images for recognition and retrieval purposes (Szeliski 2010). We used 150 x 150 pixels versions of Instagram images available via Instagram API. The images are in RGB format. We have used the raw pixel values as a vector for training (thus, for each image x_i we have $x_i \in \mathbb{R}^n$ where $n = 150 \times 150 \times 3 = 67,500$). To speed up training of the clustering and classification algorithms, we use Principle Component Analysis (PCA) and select the top 80 principle components to reduce the dimensionality of the data.

Using these 80 values, we clustered the images using the K-means clustering algorithm. In the K-means algorithm we must select the number of clusters we wish to find a priori, and here we selected this to be $K = 500$ and iterated the algorithm 50 times with random initializations. We found the "top" clusters by ranking clusters from the lowest average distance of images to their respective cluster center, to the highest. As even clusters that consist mostly of a single work will have false positives we manually removed such images.

As the resulting clusters contained photos of only a single work, we now had a labeled data set. Using this labeled data set, we trained a Random Forest classifier with 500 trees and used it as the test set for the images that were not part of the "top" clusters. We used the predictions of the Random Forest classifier to find additional photos of the same work that were not detected in the first step (Hastie, Tibshirani, and Friedman 2008).

Results

Out of our full dataset of 28,419 photos, we decided to only use photos showing seven artworks. Using the methods de-

scribed above, we selected all photos showing each of the works (4,559 photos in total). We numbered these clusters as illustrated in figure 3.

Our 7 clusters include the following number of photos: cluster 1: 575 photos. cluster 2: 704 photos. cluster 3: 783 photos. cluster 4: 638 photos. cluster 5: 267 photos. cluster 6: 1,142 photos. cluster 7: 449 photos.

Temporal Patterns

Each photo in our dataset is stamped with its specific upload time to the application. This allows us to look at temporal patterns in the data. First, we plotted the entire dataset of images to show the volume of shared photos in each day, from October 1st to November 20 (see Figure 4). The least number of shared photos is on October 6, when no new work was announced. The highest number of shared photos in our dataset was on October 20, for the work in cluster 6.

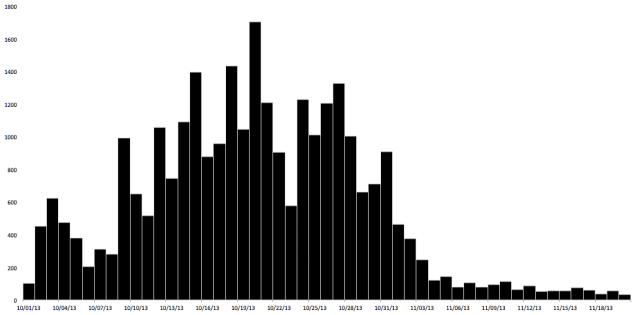

Figure 4: Number of photos annotated with the hashtags #banksy and #banksyny (a total of 28,419 photos) for each day from October 1st to November 20th 2013.

We also plotted the data over time for each cluster (Figure 5). While all clusters show a similar pattern (first a few photos, then a rapid rise, followed by a gradual decline), a few unique patterns emerge.

In two cases images were posted before Banksy's own photo of the same work. In cluster 2, nine users posted a photo of the artwork one day before the it was announced and posted on Banksy's account and website. In cluster 4, fourteen users posted a photo of the work starting from ten days before Banksy posted a photo of the work on his official Instagram account. As we can tell from these results, some of the works were installed a few days before their official announcement, and were then detected by social media users.

Cluster 3 also has an unusual temporal pattern. While photos in all other clusters continue to appear after the peak throughout the whole period we analyzed (up to November 20), photos in this cluster abruptly stop on October 31st 2013. And finally, in cluster 7, contrary to all other clusters, many photos of the new artworks were posted at nearly the same time.

In summary, every hyper-local event in our case study – creation of a new artwork by Banksy and photos by users of

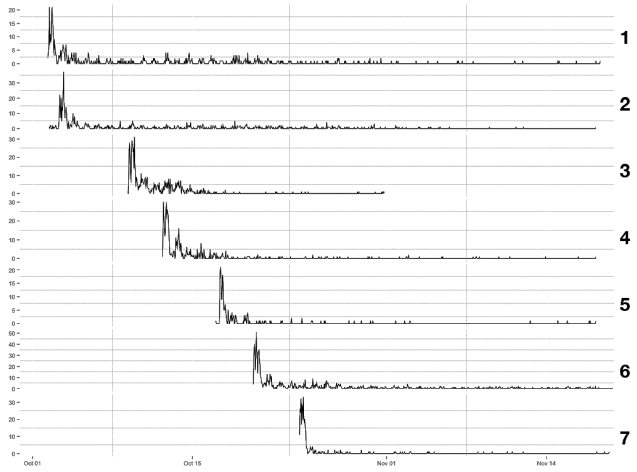

Figure 5: A temporal plot of each cluster organized by time (X) and volume (Y).

these artworks shared on Instagram – has a different temporal profile in the beginning. In other words, while the "tails" are rather similar, the "heads" are different.

Spatial Patterns

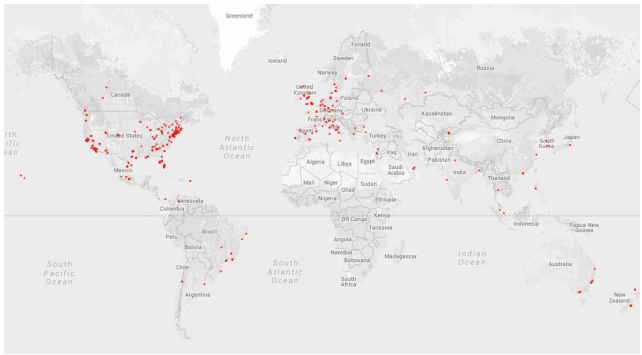

Figure 6: A global spread of all geo-tagged images with the tags #banksyny or #banksy. 16,164 images are in NYC, and 2,571 images are outside of NYC area.

Our data contains 65.9% geo-tagged images. To study the global spread of a local event via social media, we visualized the data in two ways. First, we plotted all geo-tagged images with the tag #banksyny and #banksy over a world map in order to locate the geographical "boundaries" and see how far the photos of particular artworks have travelled (see Figure 6). While 16,164 photos are from NYC area, 2,571 photos of the event are spread over Europe, Australia and the West Coast of the US.

Then, we plotted our 7 clusters over a world map using different colors for each cluster, to see the spread of photos of each work (see Figure 7). As the visualization shows, some clusters are more concentrated than others, and remain in their confined original places where artworks were created (i.e. cluster 5) while other clusters are spread over entire

Figure 3: Instagram photos of 7 of Banksy's artworks used in our case study (selected from the larger set of photos for each artwork). Top: original photo posted by Banksy. Bottom: a montage of 4 photos taken by other users.

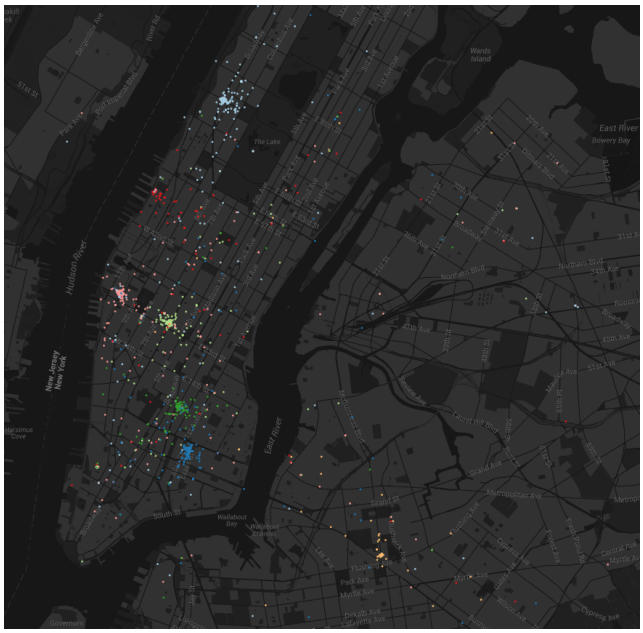

Figure 7: A map of locations of all photos from our 7 clusters (Only NYC area is shown). Each cluster is colored in order to represent the spread of photos of the same artwork: Pink - cluster 1. Light Green - cluster 2. Blue - cluster 3. Green - cluster 4. Orange - cluster 5. Light Blue - cluster 6. Red - cluster 7.

NYC or even the entire globe.

In addition, we visualized 16,164 images geo-tagged to NYC area (from both #banksy and #banksyny sets) using a radial layout, sorted by location (perimeter) and upload time (angle) (Figure 8). Each "ring" represents a different location in the city and the location on the ring represents the upload time of an image. Each ring is assembled by photos of the same work (since they are from the same location). Similar to Figure 5, this visualization shows how each ring has a different "life span", and allows us to compare content of images, locate areas with concentration of images, and compare differences and similarities between different locations and time periods (The original visualization has resolution of 20,000 by 20,000 pixels, which allows us to see details of all photos [see close up in bottom of Figure 8]).

Visual Patterns

Our informal examination of photos in each cluster revealed significant differences in their visual characteristics. There are multiple reasons for these differences, ranging from different conditions when photos were taken (time of the day, weather) to the use of Instagram filters. While some of these differences are not intentional, others are. By adding a filter, or photographing an artwork from a particular angle, or posing with an artwork, or interacting with it in some unexpected and funny ways, people add their own meanings to the artist's works. While such additions and "rewrites" can also be found in 20th century (for example, fans creating their own versions of Star Trek episodes, or participating in an art happening), social media photography as exemplified by Instagram offers new ways of interpreting or rewriting the message of a hyper-local event, and immediately sharing it with others.

To further study the visual differences in the photos in each cluster, we extracted multiple visual features from each image (contrast, hue, brightness, etc.) and plotted all images in each cluster using the values of these features. In Figure 9, we visualized photos in each cluster organized by brightness mean on X axis, and hue mean on Y axis. We indicated the locations of the photo taken by Banksy himself using red squares.

This allows us to see the positions of Banksy's own "official" photos of his artworks in relation to all other photos of the same artwork taken by other people. The visualizations show that visual variability (at least, as indicated by the two features we used) changes significantly from cluster to cluster (due to the different colors of each work, location, time of

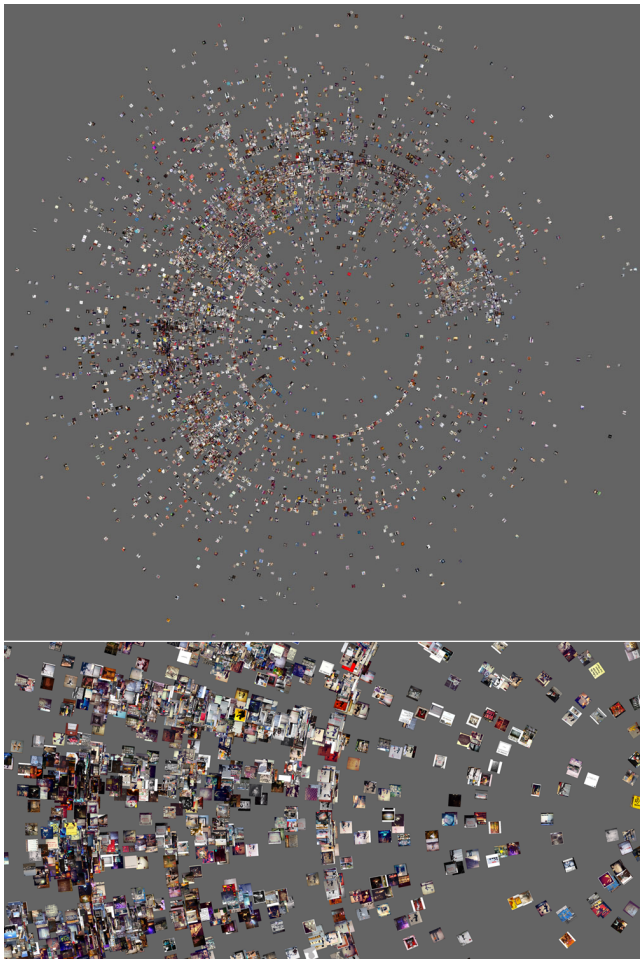

Figure 8: Top - Radial visualization of 16,164 Instagram photos geo-tagged to NYC area between October 1 and November 20,2013. The photos are organized by location (perimeter) and upload date and time (angle). Bottom - Close up.

day, and other factors), They also show that Banksy's own photos do not lie in the center of the clusters. Instead, the photos of other people create their own center – an unofficial "canonical" image of the artwork different from that of the artist himself (if we want to quantify this observation, we can calculate the distances between the center of each cluster and the original photo taken by Banksy).

We also analyzed the presence of people in each of our clusters. Figure 10 shows a montage of two clusters (no. 2 on the left; no. 6 on the right) sorted by day (X axis) and divided into photos with people (top) and photos with no people (bottom). While in cluster 6 we found 17.3% of photos with people in them, in cluster 2 we only found 7.2% percentage of such photos. These results show how the design of the work in a particular place affects social media activity within this place. In this case, two relatively similar works generate significantly different reactions as manifested in their social media representations. (See figure 3 for images of these works.)

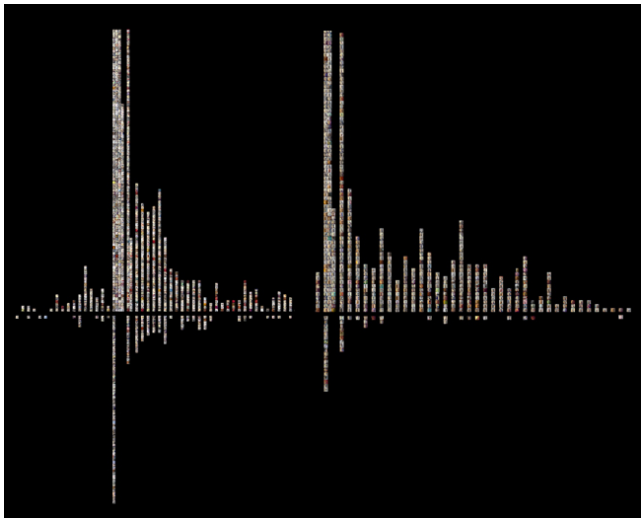

Figure 10: Montage visualization of clusters no. 2 (left) and no. 6 (right) sorted by time (X) and volume (Y). Top montage includes only photos without people in them while the bottom montage includes only photos with people.

Finally, we sorted each of our clusters by time and hue. These visualizations reveal the changing appearance of the artworks over time, as each was repainted, sprayed and manipulated. Figure 11 shows these patterns of visual change over time in cluster 2 (left) and cluster 1 (middle), organized by hue mean (X) date and time (Y). Cluster 1 shows an interesting pattern. An early photo of the work taken when it initially appeared was re-circulated time and again, and appears at different later times, together with photos of the work in later stages after it was sprayed on and damaged (see close up on the the right side of figure 11).

Characterizing Hyper-Locality

If social media hyper-local data is a particular manifestation of a "hyper-real" world (Eco 1986) where images and simulations of an event have greater significance than the actual site where this event took place, Banksy's art project in NYC can be seen as an attempt to define the characteristics of this type of hyper-reality using social media.

The relation between the "superior" status of social media representations over the physical place are the main subject of Banksy's inquiry. By announcing the location of his works via a daily photo shared on Instagram, and asking all visitors taking photos of these artworks and posting them on social media platforms to tag them with a specific hashtag, the artist transformed the visit to the physical location into a banal experience, and actively turned all these tagged photos into a representation of this banality. This banality is double sided. One the one hand, it is banal in the sense that the visitors to each location followed the online representations of this location left by other people. On the other hand, Banksy himself already took an image of that work in that place and

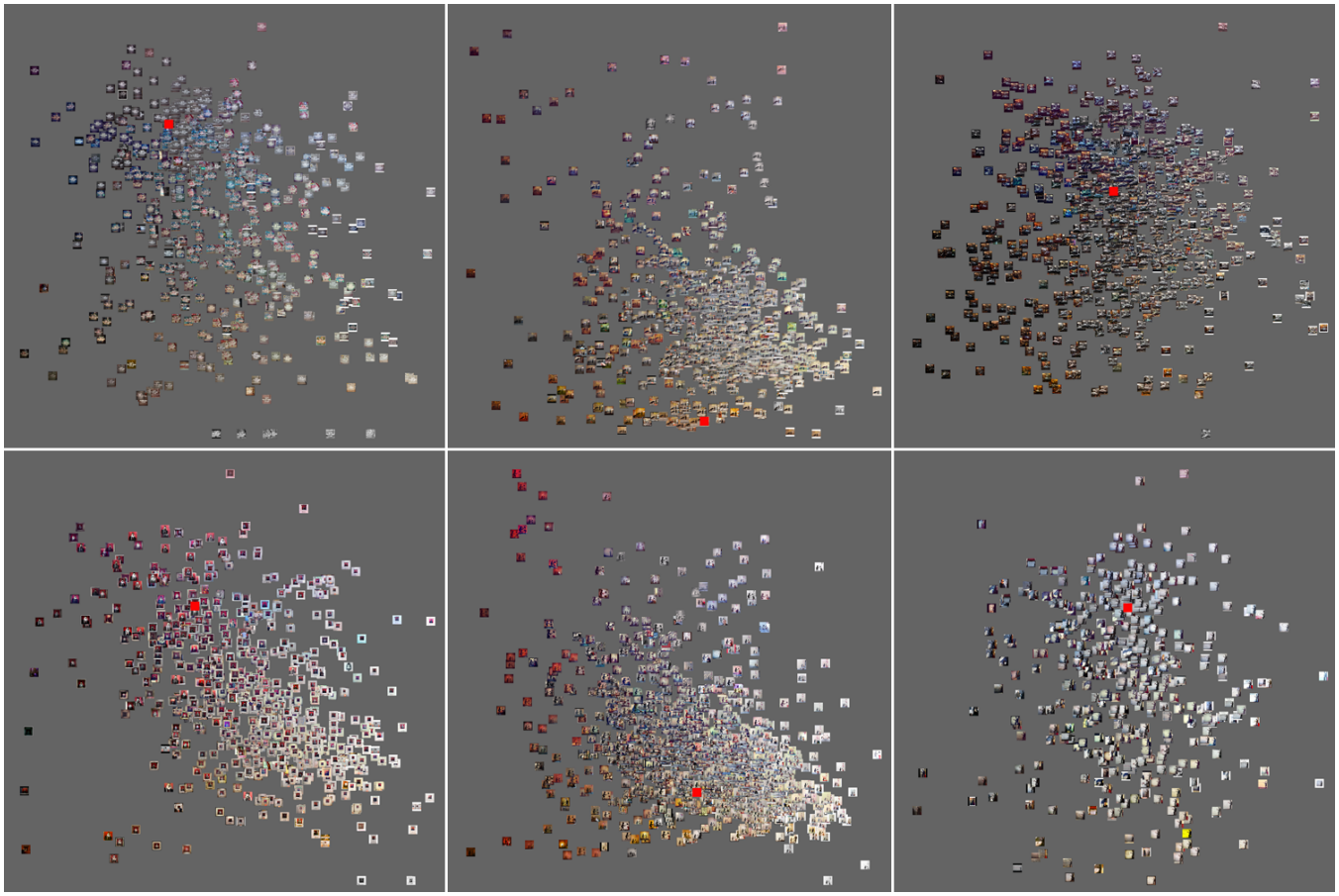

Figure 9: A matrix image plot visualization of 6 clusters. In each cluster, (X) - brightness mean, (Y) - hue mean. A red square represents the original photo of an artwork posted to Instagram by Banksy himself. Top row from the left: cluster 1, cluster 2, cluster 3. Bottom row from the left: cluster 4, cluster 6 and cluster 7.

all other images are reproduction of the same "original" image.

In this sense, Banksy experiments with the ways in which a site becomes the sum of its multiple fragments, an endless signifying chain of photographic social media sights. By turning a physical site-specific work into a "hyper-local social media work," Banksy's project emphasizes the historical parallels and differences between the nomadic Modernist understandings of the visual versus the native, site-specific notion suggested by the neo avant-garde as we described above. Banksy offers us "staged" performances that have unique time and space coordinates–but at the same time they are designed with the understanding of social media trails. While the actual "original" performance is still a spatial experience and thus is similar to 1970s site-specific performances (you have to be there), its social media representations are not experienced physically (you don't have to be there) and thus they have different characteristics.

Put differently, if site-specific works aimed at the spatialization and territorialization of the visual experience (grounding it in time and space), hyper-local social media data is actually a manifestation of its temporalization and "de-territorialization." Social media hyper-local data converts a place into an endless set of exchangeable sights that do not generate a single sense of that place. Rather, this vision is now constructed from an endless series of representations that are for the most part a manifestation of different times in that place. In other words, the experience of a place via hyper-local social media data is not spatial (we do not "navigate" a space through these representations). But it has elements of temporal experience in which we are occupied with the "distance" of each representation from all other representations of that location (see Figure 11).

Generalizing from this discussion and the particular case study of the Instagram photos of Banksy artworks, we propose that hyper-local social media has three main characteristics:

1. **Fragmented:** As apposed to physical spatial sensorial experience of a place, social media hyper-locality is a representation of fragmented performances and exhibitions from multiple perspectives and times. If site-specific artistic works aimed to "localize" our experience with the visual and turn it into the sum of its interactions in time and place, the hyper-local is a contemporary manifestation of

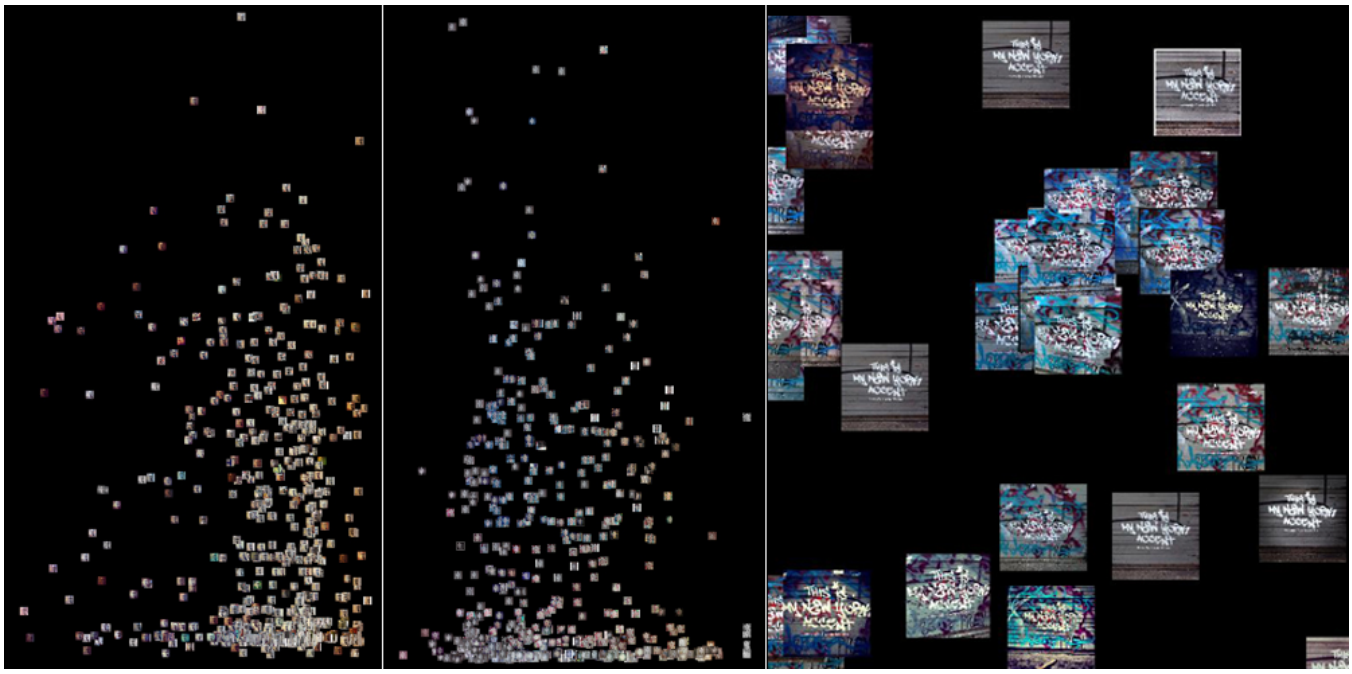

Figure 11: Visualization of cluster 2 (left) and cluster 1 (middle), sorted by hue mean (X) and date (Y). Right panel shows a close up of cluster 1.

a similar desire: the (visual) hyper-local is now the sum of its multiple media representations of people interacting in place and time. As such, these representations allow us to explore interactions in that space (i.e., Figure 10), track their multiple representations (i.e., Figure 1), and explore their relations to a physical location (i.e., how the structure of a physical place conditions social media productions within it), as well as other dimensions.

2. **Temporalized:** Differently from spatial physical experiences of a physical place, fragments of hyper-local data are experienced temporally. They are not meant to represent a map of a place, but rather an "itinerary", schedule, or route, a sequence of representations of time within a space. This allows us to compare different temporalities in a place (i.e., by various social groups), to compare temporalities of different places (i.e., Figures 8, 5), and experience the dynamic structure of a place over time (Figure 11).
3. **Nomadic:** Hyper-local social media representations are always nomadic not only in terms of the unstructured narrative of a place articulated by the multitude of paths of people within it, but also by the spread of images that transcends the original boundaries of that place into larger areas (such as the entire city and other locations around the world). In this sense, and in a paradoxical way, as our results demonstrate, while the geo-temporal tagged image is indeed a realization of avant-garde aspirations to contextualize the visual in time and place, social media platforms also bring back the nomadic modernist understanding of that visual, as it is shared by users not only in their original location but also in other places around the world (i.e., Figure 6).

Conclusion and Future Work

In this paper, we offered a theoretical analysis of hyper-local social media. We discussed critical aspects in the presentation of hyper-locality in social media, and noted crucial elements in the analysis of a physical place via the multitude of its performances and exhibitions in social media platforms.

We analyzed contemporary hyper-local media in relation to two important paradigms in 20th century visual art. We also looked at the relation between physical places and their social media representations using a particular case study - social media photos that were tagged and shared on Instagram during the street artist Banksy's month-long residency in New York, October 2013. Finally, based on our theoretical and historical analysis and the case study, we proposed key characteristics of hyper-locality in social media: **fragmentation**, **temporalization**, and **nomadicity**.

Future work should expand the study of photos captured and shared in other types of places, exploring what types of patterns can we learn from their fragmented, temporalized and nomadic structures.

Paying attention to the particularities of a place in social media platforms requires a deeper understanding of the functions of its representations. Only by taking into consideration the complexities of the ways in which we experience, perform, and exhibit our locality in social media, we are able to study social-cultural currents as well as design and develop tools that will better portray and facilitate online and offline local interactions. If social media can express the uniqueness of places and temporal patterns, our analysis

needs to take this into account, as opposed to only focusing on what certain places and time periods have in common.

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