

# Movement Through Urban Space

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## ABSTRACT:

How do artists depict and map urban environments? Throughout history, artists have used the most recent technologies available to create images of what surrounds them. I have always been interested in how the city can be represented, first through photographic images, later through websites and now through using code. *Movement Through Urban Space* is a multi-faceted project which includes prints, animations and an installation that uses the program Processing to create representations of urban space and to draw the figures who populate the city to the screen. This project has evolved into a visualization that depicts the number of unemployed people in a given country as animated figures moving in an abstract representation of urban space. On the screen, as well as in the installation viewers can compare and contrast the number of unemployed (taken from data from the Bureau of Labor Statistics) by states as well as world wide.

## CONCEPTUAL FRAMEWORK:

Throughout history artists have used the most recent technologies available to create images of what surrounds them. How we see the city, how we move through it and how we depict its image has changed significantly from the nineteenth century to the present. Photography can be seen as the first major change in the technology of representation since the re-adoption of classical perspective in the Renaissance. In the 19th century, photography was instrumental in the construction of the image of urban space, while in the twenty-first century we rely on new technologies to aid us in not only representing the city but also in negotiating it. This paper will first look at images of the city made with a camera, focusing on photography as a technology, and then trace how as technology has changed, so has the way urban space can be depicted.

The change in the image of the city can be seen as a transformation from traditional landscapes horizontal space to a celebration of the vertical, to a recognition of the social, and finally as a three dimensional and networked space where everyone and everything is connected through wireless technologies defying both vertical and horizontal depiction. With technology we can now virtually inhabit and see a city while never leaving home.

Photographers living in Paris in the late-nineteenth century were the first to begin a systematic documentation of the city. Their photographic archive illustrates the transformation of Paris and presents it as a sprawling but uninhabited city that expands across horizontal space. One of the first photographs of the city, *Boulevard du Temple, Paris*, was taken by Louis Jacques Mande Daguerre, circa



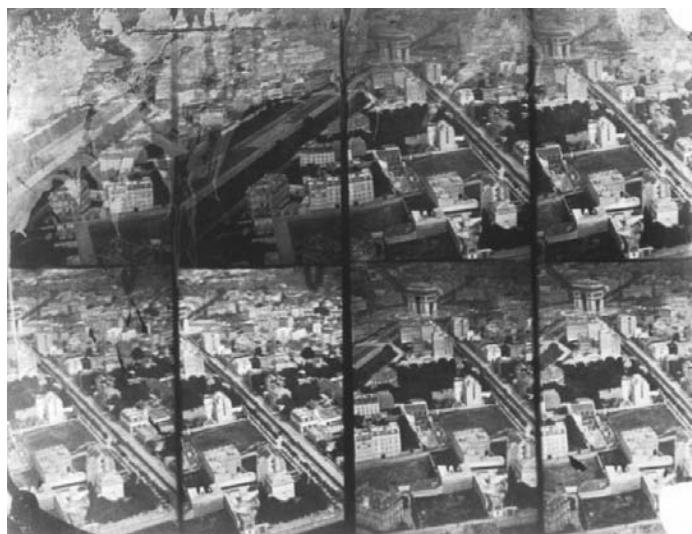
Louis Jacques Mande Daguerre  
*Boulevard du Temple, Paris*, circa 1838

1838. This image represents the view seen out his window. Daguerre pointed his camera toward the street in an attempt to capture the action along Boulevard du Temple in Paris. Because of the long

exposure time, the movement of people disappeared, leaving a vacant street. In this photograph only the stationary man having his boots polished is visible. The image becomes a document of an event as well as of architecture. Although this photograph captures the size and shapes of the buildings as they recede along the empty boulevard, it is also of interest because it is an image of voyeurism. It reflects the predatory nature of photography; the camera's ability to record without being noticed. Daguerre was not the only artist to record his impressions of the urban landscape.

Nadar gave Parisians their first view of the expanse of their city when he surveyed Paris in a hot air balloon, photographing the city from above. In the image, *Arc de Triomphe and the Grand Boulevards, Paris from a Balloon*, (1868), Nadar presents multiple views of the city taken with a specially developed multi-lens camera that could capture a succession of images simultaneously. In addition to being the first aerial view of the city, it is also one of the first composite images.

Photographic and painted images being made at the time fed off each other, specifically in the works of Gustave Caillebotte, Gustave Courbet, Edouard Manet, Claude Monet and Camille Pissarro. Both painters and photographers working at this time were



Nadar, *Arc de Triomphe and the Grand Boulevards, Paris from a Balloon*, (1868)

interested in capturing aspects of the street, and the actions and interactions of people promenading along the brand new boulevards. Claude Monet's *Boulevard de Capucines, Paris* (1873-74) captures the flux of the urban environment. Similarly in Camille Pissarro's *Avenue de L'Opera* (1889) the



Claude Monet *Boulevard de Capucines, Paris* (1873-74)

activity in the street on a winter's morning is depicted. On the other hand, Gustav Caillebotte's painting *Le Pont de Europe* (1876) is an image of flaneurie. It depicts wanderers who are enjoying the day on the bridge that connects the Gare Sainte Lazare to the new adjoining district. In addition to images of bourgeois life, lower class subjects came to be featured in art, taking after the new realist literature of Balzac, Hugo and Baudelaire. With the urban population surpassing that of the country for the first time in history, the crowded and unhealthy conditions of the city soon became a problem. Fear of the poor and their dark, cramped and dangerous slums led Napoleon III (and others in London, Glasgow and later New York) to tear down great sections of the city in order to rebuild them in an orderly fashion.

Paris during the mid 1800s was a city in transition. It was the time of Napoleon III's demolition and rebuilding directed by Baron Georges-Eugene Haussmann. Napoleon III and Haussmann devised a master plan to clean out and open up the slums of Paris. The narrow intertwining streets and the old rickety buildings were to be destroyed to make way



Camille Pissarro, *Avenue de L'Opera* (1889)



Gustave Caillebotte, *Paris Street, Rainy Day*, 1877



Gustave Caillebotte, *A Traffic Island, Boulevard Haussmann*, 1880

for larger, wider boulevards. In 1856 Charles Marville began photographing parts of Paris that were slated to be transformed by Haussmann. His photographs celebrate the new and condemn the old. The thousands of images that constitute the archive Marville left behind describe the before, during and after of Haussmann's transformation. The desire to photographically document the city in its entirety was a project that preoccupied Marville, as well as one later undertaken by Eugene Atget. Atget photographed in Paris forty years after Marville and his images are filled with a nostalgia for the old Paris that was quickly disappearing. It is clear that Marville chose to celebrate the possibility for change, where Atget's images linger in the nostalgia for another time and place. Marville documented the physical city of Paris. Atget wanted to construct an image not just of the topography of Paris and its environs but of its culture.

In the late nineteenth century the United States experienced a building boom in response to economic prosperity and the desire to rebuild that followed the civil war. By 1910 it was difficult to see New York through the picturesque conventions of earlier photographs and paintings. Unlike the photographers who recorded the sparsely populated views of Parisian boulevards, the chroniclers of New York conveyed the density of the new city and glorified its verticality. They were able to do so because of technological advances in both cameras and film. The city engendered a different experience, not just because of its burgeoning skyline, but also because of its pace and the exploding population. New transportation networks and technologies were reshaping the city and American artists celebrated the new urbanism in all aspects of their artistic practice. They began to display multiple perspectives (through Cubism), frenetic movement and activity (like Futurism) and idealist geometry (like Constructivism). As Merrill Schleiler has suggested in *The Skyscraper in American Art*, "Like Cubism, modernist photography deconstructed the omniscient point of view of central perspective because the vertical space of skyscrapers obliterated the horizon, leaving only extreme perspectives and angles, while the speed of modern transportation collapsed space and time." The city was no longer just an image across horizontal space. The invention of the modern city crowded with skyscrapers forced people to look up. Photographers not only looked up, but went up and pointed their cameras down. Although Nadar was the first photographer to picture the city from

the sky, skewed perspectives of buildings and abstract croppings soon became the norm.

Artists collaborated with filmmakers, writers and theorists and made declarations and manifestoes that called for changes in the urban environment. Many left the world of static art behind. The Futurists explored the relationship of man to the mechanized world. For them the city was a backdrop onto which



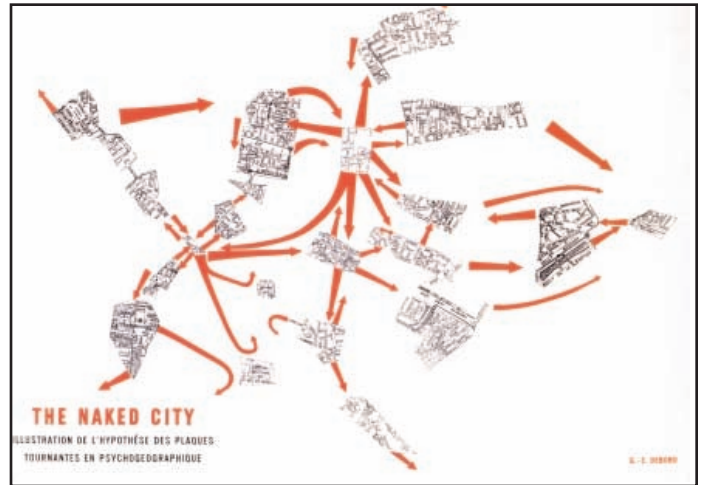
Umberto Boccioni, *The City Rises*, 1910

the dynamism of everyday life was projected. They wrote manifestoes and made diagrams, models and artworks that celebrated speed and violence, as seen in Umberto Boccioni's painting from 1910, *The City Rises*. After the Futurists, the Dadaists called for chance interactions between art and life, while the Surrealists pursued ideas relating to the unconscious and the irrational. As artists began to map the experience of urban space rather than depict its image, the social and economic conditions that they confronted began to appear in their artworks. In the late 1950s the Situationist International (S.I.) was born. The Situationists were a group of French artists and thinkers who broke from the Surrealists.

Rejecting art objects in favor of social realities and life situations, they had a political conception of the built environment and urban space. Their artworks (like Guy Debord's collage from 1957, *Naked City*), posters, and maps plotted actions that existed in the city and disrupted the orderly flow of modern life. Members of the S.I. constructed encounters and creatively lived moments in specific urban settings that critically transformed everyday events such as going to the museum, to church or to the movies. The spatial investigations associated with the Situationists, including the ideas of the *derive*, *psychogeography*, and *detournement* were further

developed by the conceptual artists in the next decade. Photography played a major role in the attempt to jettison the art object in favor of the conceptual record.

Conceptual artists working in the 1960's were inspired by Situationist ideas and adapted them to their own purposes. They were interested in what went on in the urban environment and created situations or spectacles using the street as their stage.



Guy Debord, *Naked City*, 1957

Photography and later video was used to document these events and the resulting images often became the only proof of their occurrence. These artists functioned as surveyors of the city, wandering through it; not photographing it as artists before them did, but engaging with it and using the camera to record their interactions. Douglas Huebler was one such urban wanderer who captured random occurrences in the city. Huebler coupled photographs with statements that defined a photographic selection within the larger scope of his work: to document everyone alive. "Throughout the artist's lifetime he will photographically document, to the extent of his capacity, the existence of everyone alive in order to produce the most authentic and inclusive representation of the human species that may be assembled in that matter." Vito Acconci, like Douglas Huebler, set up complex systems in which he performed the role of urban explorer. In *Followpiece*, 1969, he followed and photographed random pedestrians through the street until they entered a private space. Acconci explored the threatening and menacing aspect of city-life, questioning issues of privacy, and safety.

The postmodern city is rooted in its history. It cannot escape its past. As Frederick Jameson states, “The postmodern city is a pastiche of styles and cultures. The present city is made up of everything that precedes it and looks ahead to the future.” In nineteenth century Paris the urban wanderer was the flaneur, the distanced observer of modernity who haunted the city, strolling through the arcades, the streets and the crowds. The flaneur was caught in a time of political change and inhabited a politicized space, a space transformed by Haussmann’s restructuring of Paris. He was someone who accepted the changes to the city, and changed with it. He became the activist, the situationist, the artist. The postmodern flaneur is a skeptic. He does not idealize the city but sees it for what it is. An artist like Krzysztof Wodiczko takes full advantage of the postmodern city, using its architecture, the media and technology in his projects. Working at night, he illuminates darkened buildings with projected light and images, reflecting on political or social situations of the particular city in which the projection occurs. Wodiczko projects images of the city, back onto the city.

Technology has come a long way from the first depictions of the city where the photographer aimed his camera out the window, capturing the expanse called ‘city’ that was beginning to develop and block his view of the landscape. The image of the city that emerged from the photographic activities of Marville and Atget was one that documented every nook and cranny of industrialization. The Modernist city celebrated the vertically of the skyscraper. The Situationist’s city insisted on the coexistence of art and life. The conceptual artist used photography to record action and interaction within the urban environment. The way one comes to see and know a city has changed throughout time. Today many artists who work with technology see the city as a repository for data, as a social network and a site that can be accessed but does not have to be visited. How has technology changed the way we experience today’s urban environments?

Technology allowed Wolfgang Staehle to project the destruction of the World Trade Center Towers in real time onto a gallery wall. The proliferation of web cams and the internet allows instant views of all places. With so much data on hand, artists have begun to create complex visualizations that juxtapose real or imagined people, places and



Krzysztof Wodiczko, projection.

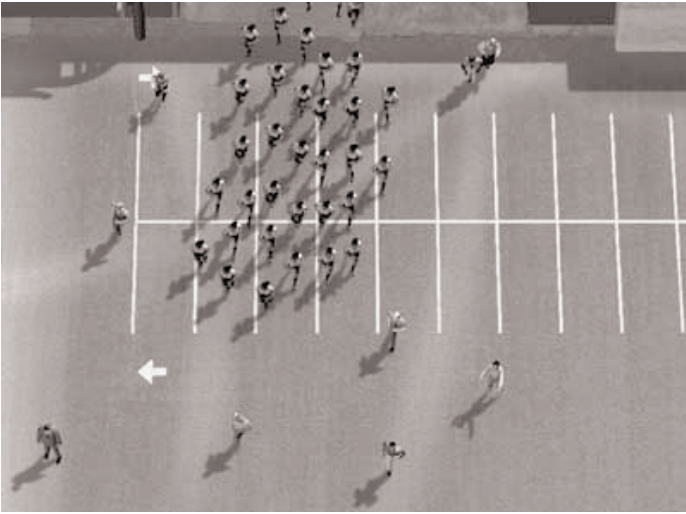


Wolfgang Staehle, *Untitled*, 2001

information. I have become increasingly interested in how technology as well as data can affect my art.

## INSPIRATION:

Some works, both in physical as well as in virtual space, that have been an influence on my artwork—and in particular this project—include Paul Kaiser’s *Pedestrian*, Casey Reas’ works using the software he developed: Processing, Rafael Lozano Hemmer’s interventions into public space, as well as web based data visualizations that use the news and news media as their source like Jonathan Harris’ online project *10x10*.



Paul Kaiser, *Pedestrian*, 2002

*Pedestrian*, 2002, was a video work that used motion tracking to map people's movements and project them back into city streets. The project was installed in numerous locations as a sidewalk projection that was encountered by unsuspecting urban dwellers. According to Kaiser, "*Pedestrian* is entirely synthetic, though the naive observer happening upon it in the city may at first take it for live video. But in fact all of the figures are 3D models, and all of their movements derive from a large library of motion-capture data that were extensively re-edited and sequenced for each of its scenes. The artwork runs in a seamless 13 minute loop. It does not tell a single story, but rather suggests multiple narratives and possibilities. This often leads its audience to guess at possible storylines, and even to spirited discussions between strangers about what it all means."

Another urban artwork that used the ground as its stage is *Under Scan* by Rafael Lozano Hemmer. "*Under Scan* is an interactive video art installation for public space. In the work, passers-by are detected by a computerized tracking system, which activates video-portraits projected within their shadow. In the installation, the portraits appear at random locations. They 'wake-up' and establish eye contact with a viewer as soon as his or her shadow 'reveals' them. As the viewer walks away, the portrait reacts by looking away, and eventually disappears if no one activates it."

While Hemmer and Kaiser engage with public spaces by inviting people who are not expecting 'art' to come in contact with their works, other artists use social practices and networks, the internet as well as the news media, as source, content and often

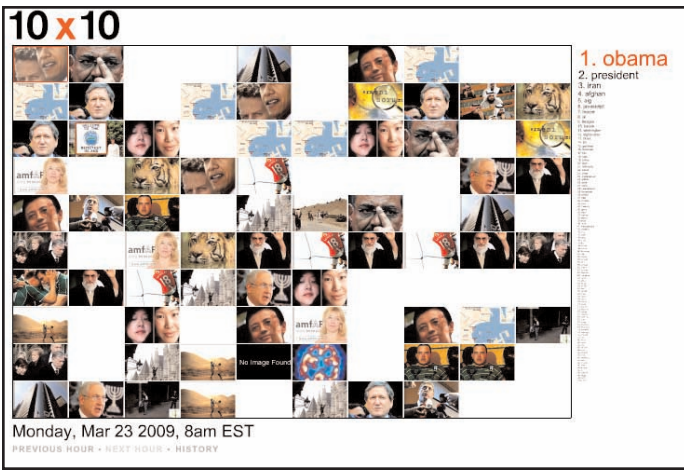


Rafael Lozano Hemmer, *Under Scan*, 2005

a method of display for their works. The web can be seen as a public art space accessible to a global audience including non artists, artists, and designers.

## THE NEWS AS SOURCE:

While the city serves as city both site and content for many of the pieces discussed here, I have used the news media, specifically images and headlines from the newspaper as the source for many of my projects. I see the newspaper as part of the urban fabric—its form parallels the grid of the city and its content reflects the numerous aspects of city life. Many artists have recently taken the news and the proliferation of online news content and used it as sources for their works. Jonathan Harris' *10x10* is a data visualization that brings together news images and stories. According to Harris "*10x10* is an interactive exploration of the words and pictures that define the time. Every hour, *10x10* collects the 100 words and pictures that matter most on a global scale, and presents them as a single image, taken to encapsulate that moment in time." Other data visualizations that utilize the news include *Newsmap* and *World/Spectrum/Archive*. *Newsmap* created by Marcos Weskamp is an application that visually reflects the constantly changing landscape of the Google News aggregator. A treemap visualization algorithm helps display the enormous amount of information gathered by the aggregator. *Newsmap's* objective takes that goal a step further and provides a tool to divide information into quickly recognizable bands which, when presented together, reveal underlying patterns in news reporting across cultures and within news segments in constant change around the globe. Similarly *World/Spectrum/Archive*, created by the Dutch



Jonathan Harris, *10 x 10*, website



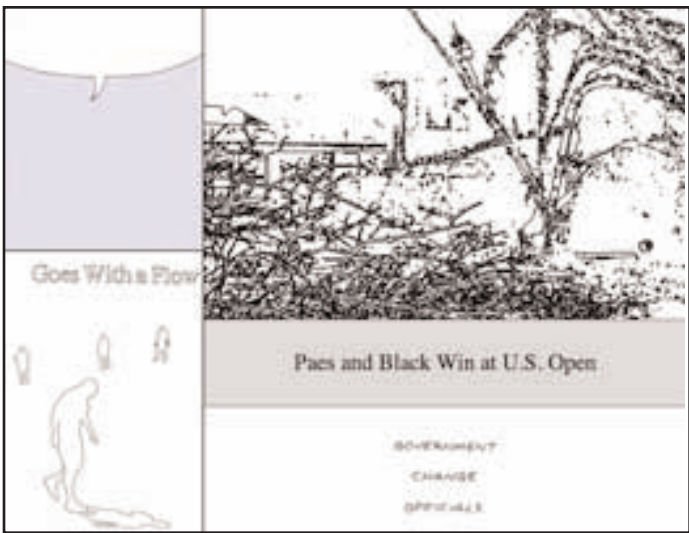
Lust, *World/Spectrum/Archive*, website



Marcos Weskamp, *Newsmap*, website

design firm Lust, uses the Google News RSS-feed to arrange articles according to their positive and/or negative impact.

These works all influences my project *Without A Trace* (a 2008 Turbulence Commission), that takes as its point of departure the idea of a daily ritual that

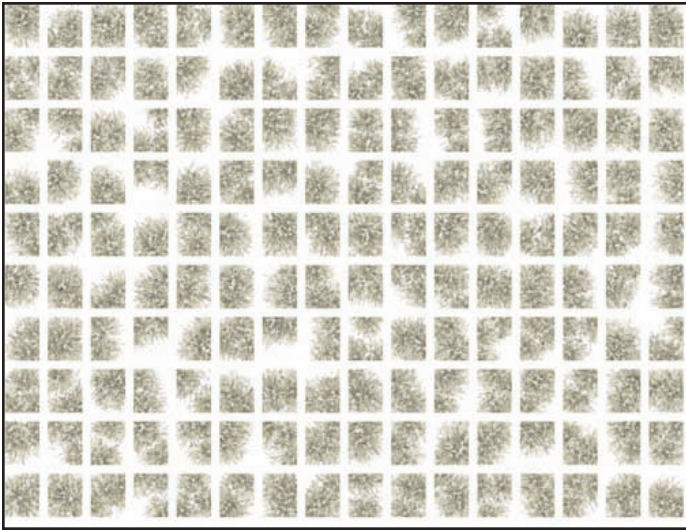


Jody Zellen, *Without A Trace*, 2009, website

grew out of my obsession with collecting a daily image from the newspaper, making a daily drawing and altering the text of a daily comic. The site randomly juxtaposed these collections and presents them alongside a live news image which has been traced by the computer and a RSS Headline taken from the New York Time's feed. The title *Without A Trace* has multiple meanings. A trace references a memory. It is what remains when almost everything else disappears. A trace is an action. One traces an image or traces over something. *Without A Trace* is also the phrase we use to refer to something that has disappeared leaving no record. The news is ephemeral, as is the newspaper. It has a given structure yet its online content changes continually. In this project I have attempted to take these disappearing elements and bring them together for the time they are viewed on the webpage. However, like all web content these juxtapositions will disappear when the browser is closed. Only to live in memory--both ours and that of the computer--challenging the title and the notion; without a trace.

**SOFTWARE ART AND DRAWING:**

Software is the foundation of Casey Reas' work. He thinks about it as processes and systems rather than as computers and programming languages. In 2003 he became obsessed with the artist Sol LeWitt and explored the relationship between conceptual art and software art. He began by implementing LeWitt's drawings in software. The process or instructions for each work became an integral part of the finished piece. As in LeWitt's wall drawings where each line is given an exact location and shape, in Reas' *Process* pieces each element is comprised of a visual



Casey Reas, *Process 6*, 2005

form and one or more behaviors. Reas discusses the relationship between LeWitt and the programmer as follows: “The relation between LeWitt and his draftsperson is often compared to the relation between a composer and performer, but I think it's also valid to look at the comparison between a programmer and the entity of execution. LeWitt writes programs for people to execute and interpret rather than for machines. This difference allows him to work in natural language, rather than the limited formal languages of computer code. He is also able to leave ambiguity in his programs, as they will be executed by skilled draftspersons who are able to interpret, rather than a machine which must be told precisely what to do.”

My interests in how the computer can trace an image and how that differs from my hand tracing made me think about how the computer ‘draws.’ If given a set of instructions, could the computer create a ‘drawing’ that had the spontaneity of one of my doodles? Could a computer generated figure show any personality? While simultaneously looking into how the computer could generate figures that had the look and feel of those that I draw, I became interested in how these figures could populate a space, specifically the space of a city.

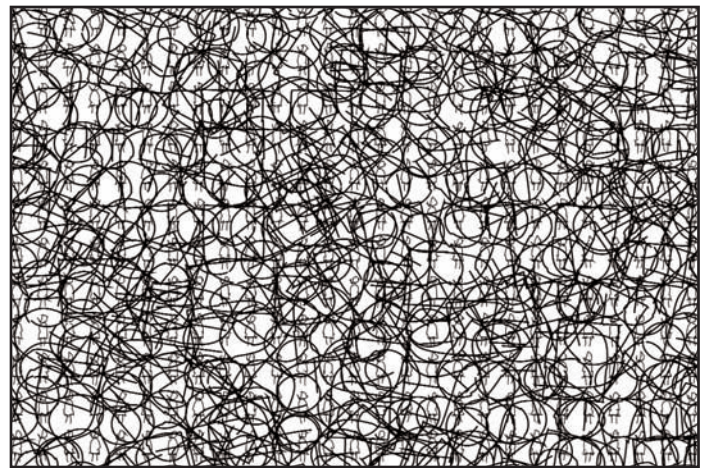
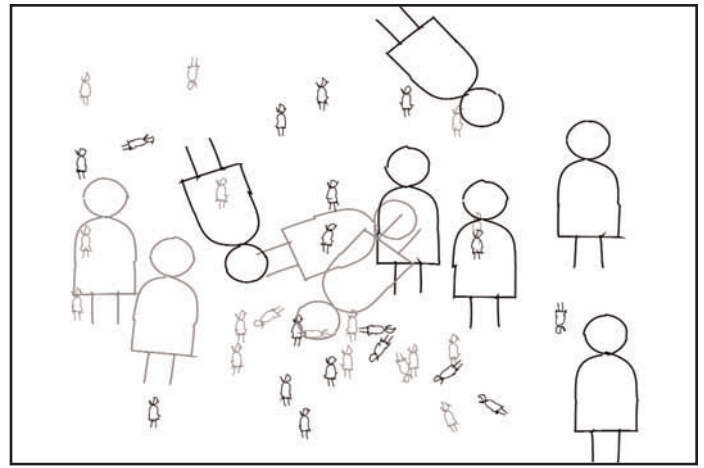
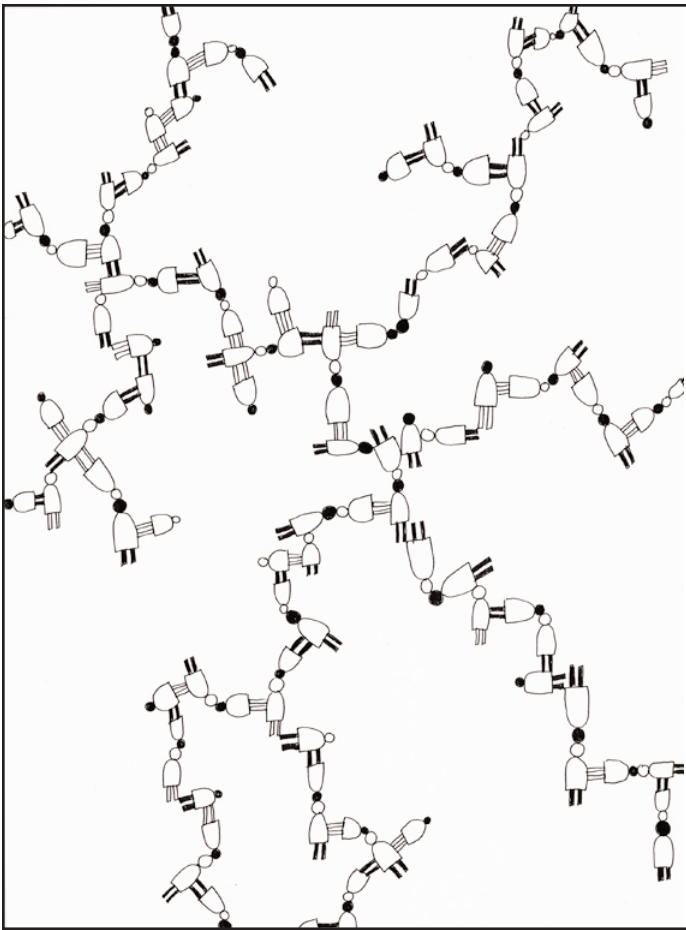
## **TECHNICAL FRAMEWORK:**

Dan Shiffman’s work with steering behaviors and his translation of Craig Reynolds’ work was used to create my simulations of how people move in urban space. Shiffman created algorithms using Processing that explored how paths could be followed based on steering behaviors. In turn, I applied these

algorithms to how my figures move along paths that represent streets and buildings. In *Steering Behaviors for Autonomous Characters*, Craig Reynolds explored how autonomous characters could navigate around their world in a life-like and improvisational manner. Reynolds mapped out the math to control specific steering behaviors (including the ability to seek, to pursue, to avoid obstacles, to attract, to flee, to wander, to follow a path, to follow a flow field and to avoid collisions) with vectors that had various strengths of separation, cohesion and alignment as well as a maximum speed and a maximum force. Reynolds work was used in game theory yet it is also the basis for the study of traffic patterns and how crowds behave. This initial research led me to a paper studying pedestrian traffic. Dirk Helberg, in *A Mathematical Model for the Behavior of Pedestrians* states, “The movement of pedestrians is supposed to show certain regularities which can be best described by an ‘algorithm’ for the individual behavior and is easily simulated on computers. This behavior is assumed to be determined by an intended velocity, by several attractive and repulsive effects and by fluctuations. The movements of pedestrians is dependent on decisions, which have the purpose of optimizing their behavior and can be explicitly modeled... Human behavior is based on individual decisions... A pedestrian wants to move in a most convenient way, tries to minimize delays when having to avoid obstacles and other pedestrians, and intends to take an optimal path and to walk with the minimal velocity allowing [sic] to reach a destination at a certain time, etc.” In addition to the basic movements of the figures, I also became interested in how they could be given specific personalities.

## **DESCRIPTION:**

In my work, Processing is used to control how animated figures move along urban paths, according to specific behaviors. These ‘steering’ behaviors chart how vehicles (figures) avoid obstacles (other people and buildings), attract and repel each other, and how they can be made to follow the paths of specified vectors. By using vectors to draw not only the figures but also the environments in which they congregate, I am hoping to draw comparisons between computer drawing and the spontaneity and personality of hand drawn lines. The initial figure drawing program is the foundation for explorations in print, animation, installation and interactive works. The printed images represent a specific



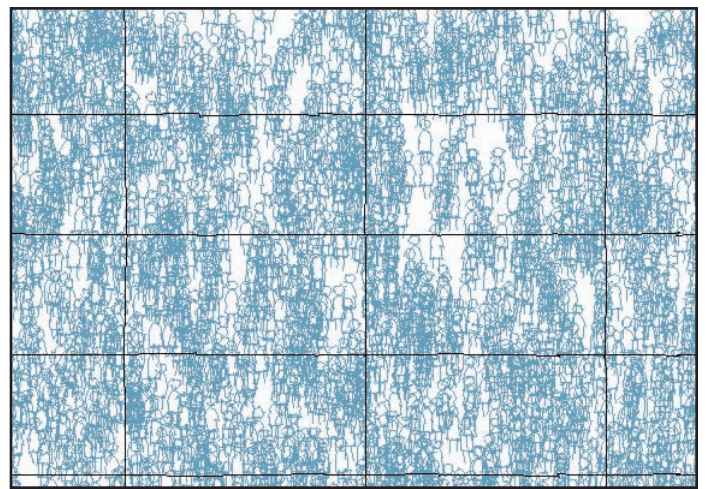
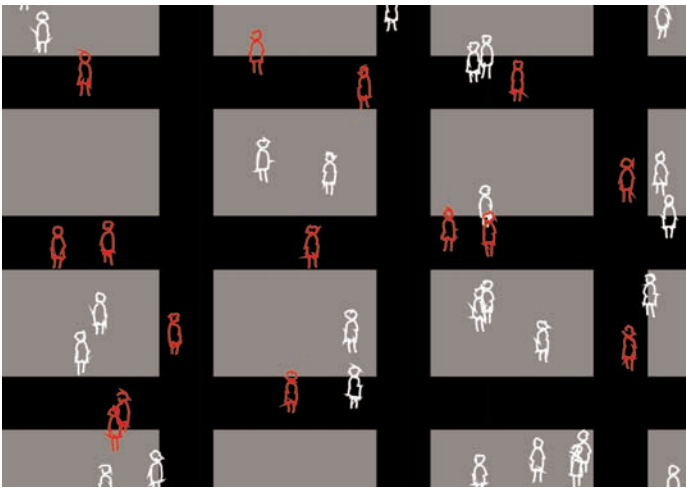
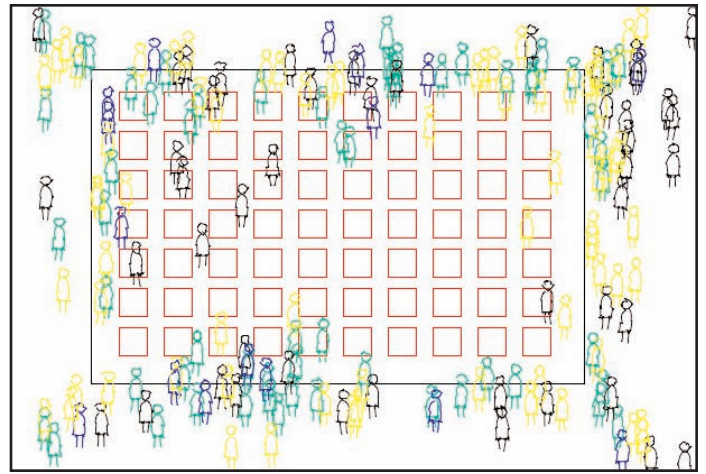
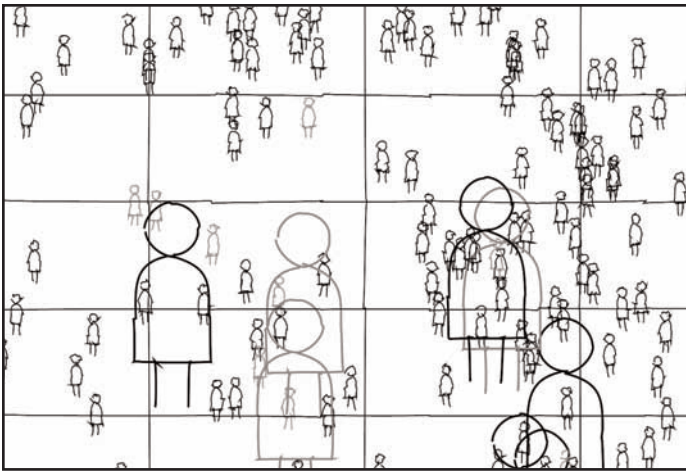
moment in time, while the animations detail the process and the potential for movement within each sketch. The installation extends the interactions into physical space where the human body rather than the mouse can be the catalyst for interaction.

While looking at installations and data visualizations that were about the media and the city, I returned to my initial ideas about drawing and how a drawing can be created by a machine. The question, “why make a machine draw, isn’t drawing about an immediacy, and an emotional response?” kept coming back to me. The challenge is how to use computational systems and machines to make images that are not about the tool or the process but about what is created.

The Processing sketches I am creating grow out of my drawing practice, daily pen and ink drawings that depict small figures alone or in masses as they move through generic urban spaces. I have long been interested in transforming these drawings into computer generated works. The figures that populate my drawings are simple combinations of circles, ovals and rectangles, but because they are drawn by hand they have irregular forms. An early goal was to recreate these figures as an algorithm so that they

could be drawn on the screen with a click of the mouse. One outcome of my thesis project is a series of prints generated through the running of this algorithm. In these drawings each time the mouse is clicked, an instance of the figure will be drawn. The size, color (shades of gray) and orientation of the figure is random within the parameters of the code I have written.

In addition to the prints, another manifestation of this project is a series of animated sketches that depict computer generated figures executed as a series of connected lines whose movement is determined by a set of rules. I reinterpreted the movement of Reynolds’ generic boids (triangle shaped objects), transforming them into urban wanderers moving through crowded spaces. Since I am always bumping into people as I walk down crowded streets, I used these interactions as the basis for my research. My computer generated figures follow paths that suggest streets. They cluster together in open spaces, and avoid bumping into buildings, yet they sometimes collide with each other as we tend to do when we are moving through crowds.



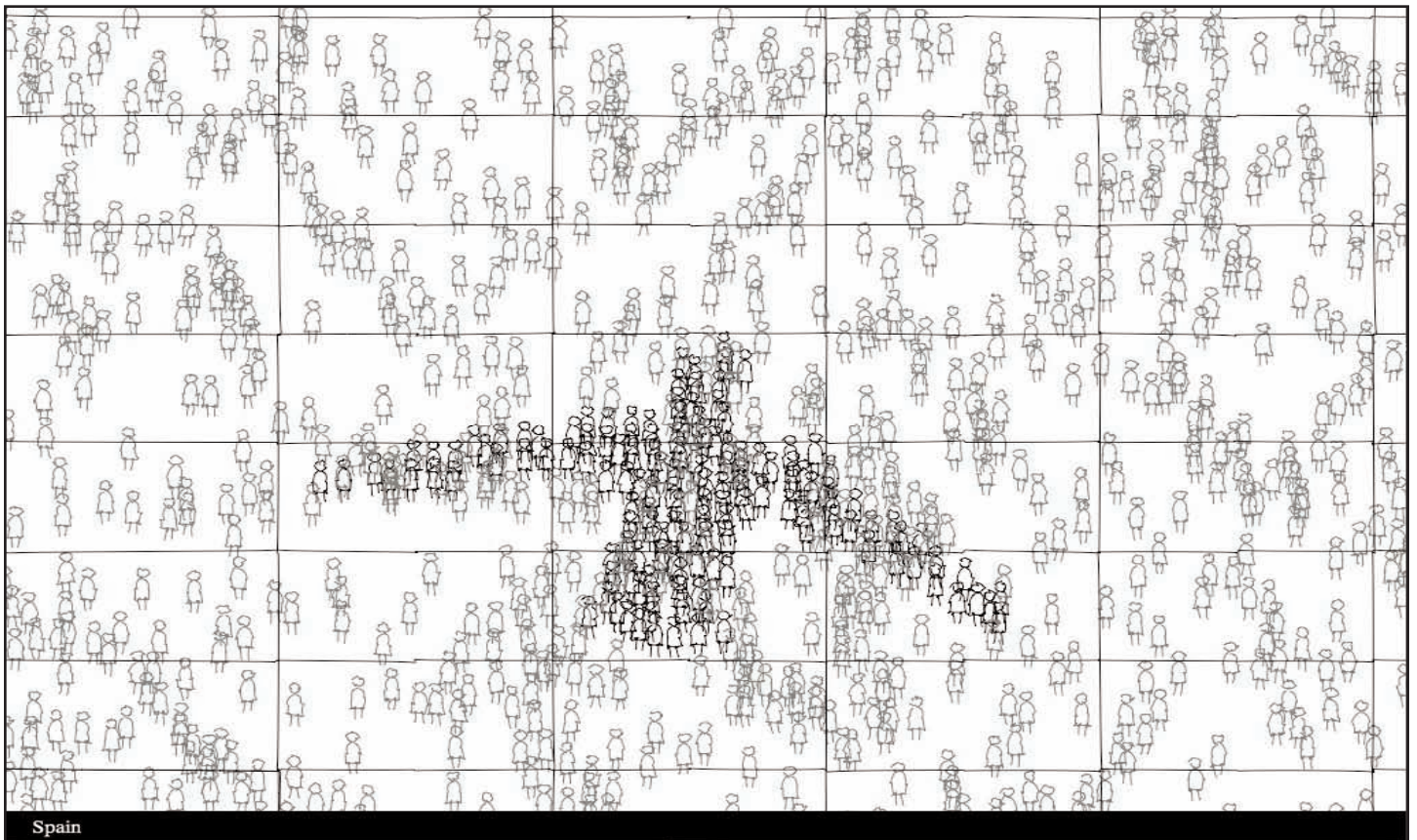
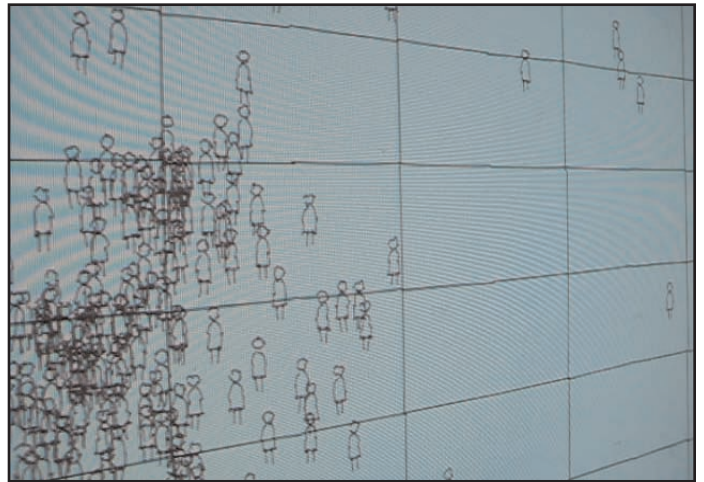
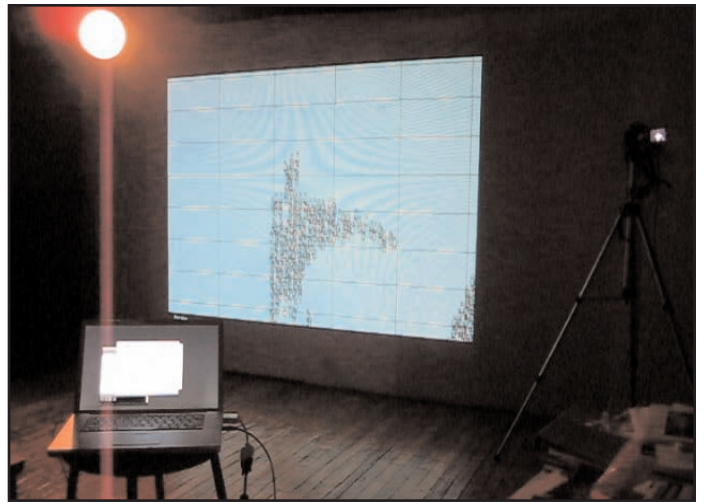
## VISUALIZING DATA:

Some of the locations through which the figures roam are based on diagrams and maps of American and European cities. For example, one sketch uses a map of the city of Paris that illustrates how Haussmann transformed the boulevards into walkable arcades that emanated from a central location. Another sketch represents the gridded streets of New York City and the masses of people

who walk them. While drawing from historical sources for some of the sketches, I became interested in the idea of using live data as the source that determines the number of figures who populate the screen. In one version the number of figures who initially populate the sketch is drawn from data from the Web. In this example the current temperature from four cities are represented by four different colors. As the temperature changes figures are added or deleted from the scene. This initial visualization led me to research other kinds of data that could be represented as figures wandering through a city. Returning to the news as a source, I began to follow the discussion of unemployment rates not only in U.S. cities but worldwide and looked for a data source that archived those statistics. Using data from the Bureau of Labor Statistics, I began to map unemployment rates world wide, making visual comparisons between countries. In my pieces the number of figures on the screen reflects the number of unemployed. While the actual number is not given, viewers can interpret the differences and the impact that a larger number has as it slows down the functionality of the machine. An apt metaphor.

## INSTALLATION CONCEPT:

Once I was satisfied with the movement of the figures and the depiction of the unemployed on the screen, I worked to transform the sketch into an interactive installation using camera tracking. When people pass in front of a web cam their silhouette is mapped to the screen and depicted as a shadow. The figures who are aimlessly wandering the grid of the city suddenly move toward the shadow and become it. The population randomly changes filling different proportions of the people who are captured by the camera. When there are numerous unemployed, full silhouettes are made up of the figures. When the country represented has a low unemployment rate only a few figures are present on the wall. The shadow recedes when the viewer leaves the camera's field of vision, and the figures slowly return to their urban wanderings. During the dormant state—when there are no people in front of the camera—the population randomly changes from country to country. As soon as someone enters the camera's range they become a dark presence on the wall. The set up for the installation requires a computer that can run processing, a projector with a large throw so that it can cover an entire wall starting at the floor, and a wide angle firewire web cam.





## CONCLUSIONS:

I have created the website *urbanfragments.net* to house my Processing sketches as well as my drawings and animations about the city. *Urban Fragments* functions as a repository for ideas about the city and how the experience of the city can be translated into an online experience. From the opening users can peruse numerous avenues each accessible through a different vertical fragment pictured on the home page. The site investigates how various disparate parts (or fragments) when viewed together can begin to simulate a whole.

While ideas specific to drawing and how the computer draws may have been subsumed by the realization of the unemployment visualization and my investigations into the algorithms of specific behaviors, the line quality and movement of the figure is integral to this work. It is important to me that I am using the computer to generate the figures,

by plotting a succession of points that when strung together have some of the qualities of hand drawn lines.

My relationship to the camera as well as to the computer, has been to see it as a tool that is driven by technology. I first used the camera to frame the city I saw in front of me, transforming the three dimensional world into a two dimensional black and white representation. I later used web technologies to compile these and other images, making a virtual city that was comprised of web pages and animations. Now I am using software to present data as a drawing, While the hand may have been removed from the process, my goal is for the tool to disappear, giving the impression that the hand is still involved.

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- Newsmap*  
(<http://marumushi.com/apps/newsmap/>)
- World/Spectrum/Archive*.  
(<http://www.lust.nl/oog/index.php?>)
- 10x10*  
<http://www.10x10.org>
- Jonathan Harris  
<http://www.number27.org>
- Without A Trace*  
[http://transition.turbulence.org/Works/Without\\_a\\_trace](http://transition.turbulence.org/Works/Without_a_trace)

## PHOTO CAPTIONS:

1. Louis Jacques Mande Daguerre *Boulevard du temple, Paris*, circa 1838
2. Nadar, *Arc de Triomphe and the Grand Boulevards, Paris from a Balloon*, (1868)
3. Claude Monet's *Boulevard de Capucines, Paris* (1873-74)
4. Camille Pissarro's *Avenue de L'Opera* (1889)
5. Gustave Caillebotte, *Paris Street; Rainy Day*, 1877
6. Gustave Caillebotte, *A Traffic Island, Boulevard Haussmann*, 1880
7. Umberto Boccioni, *The City Rises*, 1910
8. Guy Debord, *Naked City*, 1957
9. Krzysztof Wodiczko, projection.
10. Wolfgang Staehle, *Untitled*, 2001
11. Paul Kaiser, *Pedestrian*, 2002
12. Rafael Lozano Hemmer, *Under Scan*, 2005
13. Jonathan Harris, *10 x 10*, website
14. Lust, *World/Spectrum/Archive*, website
15. Marcos Weskamp, *Newsmap*, website
16. Casey Reas, *Process 6 (Image 2)*, 2005

*NOTE:* All uncaptioned images are drawings, Processing sketches and installation views created for this project.