Plato's Cave: an Image Stream Installation within an Office Setting

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Abstract

Many people work in windowless offices where they are deprived of the sight of their outside environment. With this in mind we created a piece where a view of the surrounding neighborhood is streamed from a camera, through a network, and projected as an ambient display on a blank wall in a hallway of the School of Computer Science and Information Systems (CSIS) at Pace University. We discuss the simile of Plato's cave with relationship to our viewers, and comment on the artistic influences of Claude Monet and Camille Pissarro.

Keywords -- ambient display, Plato's cave, real-time systems, art.

1. The Concept

Influenced by the idea of a camera obscura, we strove to bring the immediate cityscape outside an office building into a windowless hallway dotted with cubicles. A camera obscura, first developed millennia ago, focuses light reflecting off objects through a pinhole, and projects it as an inverted image onto a flat surface [1]. Pinholes cannot be punched into the edifice of an office building. Hence we turned to another method of obtaining a view of the outside by harnessing a security camera to transmit a real time image stream of the streetscape adjacent to a building. This camera, placed in the window of a second floor corner office, relays an image stream through a network to another point within the second floor, where it is projected onto a blank wall. This ambient display appears on the wall as an active cityscape painting of a part of the local neighborhood.

2. The Subject

The building used in this study is situated in lower Manhattan at the intersection of Ann and William Streets, approximately 200 yards south of the Brooklyn Bridge and 500 yards east of the World Trade Center site. Downtown Manhattan streets are narrow, having been laid out during its early days as a colony. Indeed, Ann Street is one of the narrowest streets in Manhattan, barely wide enough to accommodate two car widths. Although the buildings bounding this intersection are not tall by Manhattan standards, they limit the light reaching the street to a few scattered minutes per day. Despite an overall gray pall, the street is active with pedestrians, street vendors, homeless people, construction work, automobiles, and delivery trucks. And, as the sun travels across the sky during the course of the day, the street lighting changes perceptibly, punctuated by moments of brilliance and cast shadow.

The web camera was installed to transmit this street activity. It is oriented to encompass a view of sidewalks at the intersection of these two streets, including the corner street sign (Figure 1). One intersection is at the lowermost part of the image frame. Here roofs of vehicles cut across the bottom of the picture as they turn from Ann Street onto William. The intersection of Fulton and William Streets is visible at a distance. Fulton runs parallel to the lower intersection and is seen half way up the image frame. There is a time related increase and decrease in the flow of foot traffic as the day passes from morning commute, to lunch time, and finally through the evening rush hour.

3. The Setting of the Installation

The video is projected onto the wall of an equally busy intersection in the School of Computer Science and Information Systems (CSIS). The wall is located

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Figure 1. Placement of the webcam in a corner office facing William Street.

at a nexus of hallways running from the entrance to the offices of faculty, administrators, and staff. This intersection encompasses a large photocopy machine, fax machine, and laser printers; and a point of access to the hallway leading toward the main restrooms. Virtually all of the people who spend their days in these offices are within sight of the artwork at some time of the day.

4. The Technology

Manufactured by Veo (Veo Observer), the video camera has a built-in web server that can transmit a VGA (640 x 480) MJPEG stream at a maximum rate of 7 fps, approximately 2 Mbps. The Observer has a fixed focus lens, the pan-and-tilt of which can be controlled by means of a web interface. The camera unit is connected directly to a network through a RJ-45 jack. It is accessed by a client computer running Microsoft Internet Explorer (IE) by typing the camera's IP address into IE's address field. Only one client has access to it at a time.

The client computer is based on an Intel 2.4GHz Pentium 4 processor with 512 MB of RAM and an Nvidia GeForce video card with 64 MB of RAM that supports dual displays. Microsoft Windows 2000 Professional is the operating system. A Sony VPL-CS3 LCD SVGA Projector (700 ANSI lumens), connected to a client computer, projects the contents of the Windows desktop onto the wall.

The client and server communicate via TCP over the 100 Mbps network that supports the daily activities of the CSIS faculty, staff, and students.

5. The Image Stream

The live image stream is projected as a horizontal rectangle (27"high x 35"wide) directly onto the light gray cement surface without any screen or other aid to set it off from the rest of the wall (Figure 2). Given that the video stream runs at the rate of five frames per second, figures and objects move surprisingly smoothly, albeit more slowly than actual speed. One can see figures clearly, although their facial features are not revealed. The image resolution permits the reading of text on storefronts and passing commercial vehicles. No part of the sky is visible. Sudden changes of light on streets and sidewalks outside result in dramatic color changes to the projection. Sometimes pedestrians are backlit and appear as silhouettes, almost in black and white. At other times, under more diffuse light, colors are more intense. The view is shown without any indication of the room or windowsill that exists in the corner office (Figure 3).

6. Viewers' Responses

Viewers respond to all facets of the piece. People who meet in the hallway within sight of the work tend to face towards the piece while talking to each other. There are comments about changing activity on the street, including the appearance and disappearance of familiar objects such as delivery trucks. Some workers, upon their arrival in the office, have asked whether they were recognized as they walked along the street. A few, aware of the location of the camera pointing down from the window, said that they have waved at the camera. Although faces are not distinguishable, observers tend to recognize their colleagues' familiar motions and silhouettes. Occasionally, questions have arisen as to whether the projector has been adjusted as people have been startled by dramatic changes in the color of the imagery as outside lighting has changed. There are times during the day when the reflected light on the office window causes the view to be disturbed by the reflection from within the office where the camera is located. At

Figure 2. Photograph showing the artwork installed within the office setting.

those times, dust on the window, and reflections of the furniture in the windowed office become part of the projected stream (Figure 3, upper-right). All of these changes to the artwork have evoked comment. During the initial process of running the installation we had to turn off the system for several days. Some individuals in the office area expressed happiness when the system was turned on again. On the other hand, one person expressed a lack of understanding of the purpose of the art. There have been a few wishes for a more escapist view.

7. Issues Raised by the Installation

The quality of the work is better than the average surveillance video and better than the average web-cam. However, the lens of the camera, not seeing the view with the same lens as the human eye, relays a mere impression of the scene.

7.1 Plato's cave

The relationship between the space outside, the view from the window, and the video has caused us to contemplate the concept of Plato's cave. In Part VII of *The Republic* [2], Plato discusses the prisoners in a cave who are imprisoned in such a way that they can only see the shadows cast by real figures and objects just outside the opening to the cave. Prisoners accept the shadows as their reality, and must adjust, upon their release, to the objects and light that cast the images. Plato goes on to comment that if a prisoner leaves the cave he will learn about the reality that lies outside the cave, passing by the objects and the fire, until he finally perceives the sun. Upon returning to the cave the former prisoner will have to convince other prisoners to leave the known quantity of the cave and move toward the unknown.

Like philosophers, we viewers enter every day from outside to the hallway, where we experience the image stream as a simulacrum of the streets. The image stream is twice removed from the streets by being a view of the view out the window. People think about the projected image stream as they approach the office, just like the freed prisoner thought about the prisoners left behind with the shadows in the cave. Aware when watching the image stream that we have traversed the streets outside the building, we are all like the philosophers who know what the shadows represent. Deprived of real streets and even of the cropped view from the corner office, people are aware of the unreality of the image stream yet dependent

Figure 3. Images from the webcam sampled throughout the day.

upon it for their sense of space. We suspend our knowledge of the outside to some extent while watching the image stream. In the end we know that this is just a semblance. One viewer commented at the end of the day that now she was going outside to the real thing.

Yet, the superficial likeness of this neighborhood projected on the wall does allow for some revelations. The image stream has caused all of us viewers to notice things about light and color that we wouldn't otherwise. On one occasion for example, we the installers visited the office where we had placed the camera because we thought that the camera had been moved. Instead we found that the light outside had changed in a way that had a startling effect on light and color in the image stream.

7.2 We recognize some artistic influences

We the installers, in reaction to the work we just completed, have begun to discuss the influences upon us of other artists' work. Immediately, the changing light of the our image stream reminded us of many landscape paintings by Claude Monet. Monet frequently focused on a single motif, making many paintings of it at different times of day. Two paintings of poplar trees on the Epte River can be seen in the permanent collection of the National Gallery in London: *Poplars*, and *Poplars on the Epte*. We mention these in particular for conference attendees who may have time to examine these works in the National Gallery. Others please look at them on the National Gallery web site [3]. These two examples show the dramatic differences that changes of light have on the same scene. The sky of *Poplars on the Epte* is bright blue with a few white clouds. Trees are backlit, appearing as black silhouettes. *Poplars* depicts a more evenly cloudy day with correlating greater detail in the trees looping across the canvas. So too does the image stream landscape reflect on a continual basis the differences in lighting: where intense light results in silhouetted figures moving along the sidewalks;

more frequently a gray sky allows for the perception of greater detail.

Another painter of the late nineteenth century we admire, Camille Pissarro, painted a number of French cityscapes, including many of Paris. A particularly striking painting can be seen at the National Gallery in London entitled *Boulevard Montmartre: Night*, 1897. The night view of Boulevard Montmartre is a nearly abstract painting that, while it still preserves the sharp perspective of the motif, barely represents the architecture or the carriages. Instead, the darkness is punctuated by the glow of lights from shop windows. This can be contrasted with *Boulevard Montmartre: Winter Morning*, 1897, at the Metropolitan Museum of Art in New York City. This winter morning painting of the same view displays much greater detail. Under a gray sky that casts little dramatic lighting or shadows, the windows, bare trees, figures, and carriages are quite visible. Reproductions of these and other paintings by Pissarro of Boulevard Montmartre can be found in the book *The Impressionist and the City: Pissarro's Series Paintings* [4].

Like Monet, Pissaro studied the appearance of a motif as it was affected by light at different times of day and different seasons. In his urban paintings Pissaro focused on the action of contemporary nineteenth century life, framing it within buildings, sidewalks and streets. Carriages and horses fill the streets, workers portage things, while men and women traverse the pavement. Pissaro rented a series of hotel rooms and apartments, where he painted these street scenes. We viewers are not given any insight into Pissaro's personal surroundings, where he painted, or any indication of his own presence. His view is a romantic one that focuses on the view to the exclusion of all else.

The image stream technology allows us to study the street of the twenty-first century; continuous motion of vehicles is seen on a real time basis. We avoid portraying any part of the windowsill or corner office room. Our subject is not the reality of the setting of the camera, not anything of ourselves. We preserve the romantic view. Motion and change are our subjects. Monet and Pissaro document changing light one painting at a time. Pissaro shows the life of the streets one canvas at a time. Our ambient display streams image upon image without pause, remaining eternally in the present.

8. Conclusion

We discuss this piece as a philosophical cave of illusions, and as an artistic creation connected to other art pieces. We contemplate fulfilling our viewers' requests for more exotic live streams by installing cameras in other campus office windows. In the midst of this discourse we are reminded of our true purpose by one person who confided that she checks the image stream to see whether she needs her umbrella when traveling between campus buildings. How concisely this viewer demonstrates the sentiments of Samuel Johnson who said [5]: "by the common sense of readers uncorrupted with literary prejudices, after all the refinements of subtlety and the dogmatism of learning, must be finally decided all claim to poetical honours." In the beginning we thought of this as a viewer oriented piece, and in the end this is its strength.

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