MOVIE ASSEMBLY

Internet Image Database Film Making

By

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ABSTRACT

MOVIE ASSEMBLY: Internet Image Database Film Making

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Movie Assembly is a collaborative internet film making-new media project. It aims to construct short moving images by using photographs that can be found on the internet. Because it is an internet-based project, it covers some interesting issues such as; internet image-database film making and aesthetics, social aspects of databases, new media database theories, copyright issues on the internet.

Also, this kind of film making process, in the form of a series of visual studies, reveals interesting questions such as: how to construct a moving image experience by using found photographs? How to find and download particular photographs? Each visual study in this thesis project created its own set of technical and aesthetic questions.

This paper analyses and comments on the abovementioned questions and issues by using the process of the Movie Assembly project, specifically tracing the database film making process step by step, taking a brief look at the social effects of databases, at the debates about what is new about database film making, its aesthetical features and technical difficulties, and comparing the Movie Assembly project with related projects.

ÖZ

Movie Assembly: Internet Görüntü Veribankas› Film Yap›m›

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M.A., Görsel İletişim Tasarımı

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Bahar 2007

Movie Assembly, internet üzerinden ortaklaşa film yapma-yeni medya projesidir. Projenin amacı internetten bulunan fotoğraflar ile kısa filmler yapmaktır. Projenin internetle olan doğrudan ilişkisi şu konuları gündeme getirmektedir: İnternet imaj-veri bankası ile film yapımı ve estetiği, veri bankalarının sosyal etkileri, yeni medya veri bankas› kuramlar›, internette telif haklar›.

Ayr›ca, bir dizi görsel etütten oluşan bu film yapma süreci baz› ilginç teknik ve estetik soruları da ortaya çıkartmıştır. Örneğin: Bulunmuş fotoğraflar ile hareketli resim deneyimi nasıl inşa edilebilir? Uygun fotoğraflar nasıl bulunup indirilebilinir?

Bu çalışma, yukarıda belirttiğim konu ve sorulara *Movie Assembly* projesi perspektifinden analiz ve yorum getirmeye çalışmakta, veri bankası film yapım sürecini adım adım açıklamakta, veri bankalarının sosyal etkileri üzerine genel bir bakış sunmakta, veri bankası film yapımının getirdiği yenilikleri, estetik özelliklerini ve teknik zorluklarını tartışmakta ve daha önce yapılmış ilişkili projeleri *Movie Assembly* ile k›yaslamaktad›r.

ACKNOWLEDGEMENTS

I would like to thank to Can Candan for supervising this thesis and Selçuk Artut, Selim Birsel for being a part of the evaluation process. I also would like to thank the Flickr.com developing team and the internet users who are constantly adding value to our biggest and mighty database, the internet.

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INTRODUCTION

> "The problem today is no longer how to create the right image, but how to find an already existing one"
>
> Lev Manovich[1]

The origin of the project is this quotation from new media theorist Lev Manovich where he addresses the massive web databases.

First of all this project is a challenge about using the internet. Within this project the internet itself becomes a material to create something from, other than just a site for downloading, uploading or browsing. Individual images are forming massive internet archives and these archives will no longer be considered as static and traditional photo libraries. With social networking, flexible indexing, constant expansion, instant searching and with programmable add-ons, these archives become materials.

One of these archives is *Flickr.com*, a photo sharing web site which has millions of photos tagged by users. If a person can locate and place appropriate images one after another she/he can build a virtual camera. As Manovich mentions, the hard part is finding the suitable images.

To construct a movie one needs appropriate still frames sorted on a time line running on defined frames per second (fps). For example motion pictures are normally projected at 24fps. The difference here is, motion picture camera captures what is in front of the camera to create frames, whereas in Movie Assembly there is no camera, since this project is based on just collecting and sorting the images that already exist on the web to create the frames which will make up the moving image. The process is like making an animated movie from found still images; here nothing is drawn but the frames are downloaded from the internet. From this perspective everything on the web can be a source.

[1] Manovich Lev, *The Language of New Media*, The MIT Press, 2001

This is the right time to do this kind of a project, because after the advent of the internet, nowadays people are starting to use it as a platform and a tool, with databases, online applications and services. In addition to these features of the internet, this project demonstrates another way to use the resources available on the internet.

Since 1995 I have been a witness to the evolution of the internet and am able to trace the design trends, technological developments and social effects of these. My close interest in the internet leads me to conceptualize it and merge it into my work and life. My master's thesis work evolved from such an interest.

1. Background/Context

1.1.Database:

In computer science, a database can be defined as a structured collection of records that a computer can access to answer queries. Also computer can modify the data and copy it to other databases. Basically computers are running by processing the databases according to commands they receive. And these orders are called algorithms. Every computing activity is based on databases and algorithms. For example a JPEG file is a collection of information about an image. The file itself is a database that stores the RGB information about an image. The software Photoshop runs an algorithm to display the image on the screen. When a user wants to scale the digital image, Photoshop runs another algorithm to modify the records on a database. When the user saves the file, Photoshop replaces the previous database with the new database so when the user opens the file again he/she sees the scaled version of the original image.

Databases may be constructed together to build larger and more complex databases like the internet itself. The internet is the biggest and most complex database on earth which is a mass collection of many databases. And, we are using browsers, which are algorithms, to navigate through this enormous database. What happens in the computer world is based just on databases and algorithms.

In fact, databases are not new to us. We have been using them, in such forms as yellow pages, phone directories, train schedules, class lists, libraries, encyclopedias, books, passports, ids, photo albums, music records, etc. We access these data through alphabetical ordering as in indexes at the back of books or chronological ordering as in income tracking for a business or through content tables in the form of song titles printed on music record covers. But as a database holds more and more items, it becomes harder and harder to find the desired data. Digital technology have brought a convenient search function to databases and Google showed us how important this search function is.

Before elaborating more on the search function, I have to introduce another important terminology; metadata. Metadata is simply the data about data. In Manovich's words:

> "Metadata is … keywords assigned to an image in a media database, a number of words in a text file, the type of codec used to compress an audio file. Metadata is what allows computers to "see" and retrieve data, move it from place to place, compress it and expand it, connect data with other data, and so on."[2]

For example for an image file from a digital camera; file name, file extension, file size, dimensions, color depth, date it was shot, camera settings, etc. are considered as metadata. And the search function in computing is mostly related to the metadata. As Google searches for images on the web, it looks for file name that matches your keywords. But file name and other metadata elements for a data usually do not have sufficient contextual information. Think about a digital image as in figure 01. The file name is "funny_slide_by_kevinwalker.jpg"; this name does not give any hints about the content of the image. So if you are looking for a drawing about a boy having fun in winter time, you can hardly find figure 01 on the web. So, to achieve more accurate search results tagging is introduced. People tag their images, texts, videos and sounds to make their content more accessible. For example words such as; winter, boy, drawing, slide, red, sketch, fun can be used as tags to figure 01.

Figure 01 – Digital drawing[3]

> "Once digitized, the data has to be cleaned up, organized, and indexed. The computer age brought with it a new cultural algorithm: reality-media-data-database. The rise of the web, this gigantic and always changing data corpus, gave millions of people a new hobby or profession-data indexing."[4]

Tagging itself becomes a big issue about searching through databases. A great example is the Music Genome Project. As the founder of Music Genome Project, Tim Westergren states that;

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[2] Manovich,Lev. "Metadating" The Image" manovich.net, March, 2007
[3] Digital drawing by Gökhan Okur, February, 2007
[4] Manovich Lev, *The Language of New Media*, The MIT Press, 2001

> "Together we set out to capture the essence of music at the most fundamental level. We ended up assembling literally hundreds of musical attributes or "genes" into a very large Music Genome. Taken together these genes capture the unique and magical musical identity of a song."[5]

The gene he is talking about is no different than tagging. Gender of the lead vocalist, the level of distortion on the electric guitar, the type of background vocals, etc. can be listed as tags. With this tagging structure they build a web radio website called Pandora.com and this web site helps you to "discover new music you'll love"[6]. As you enter an artist's name, Pandora.com finds more music related to your artist via the tags, so you discover similar artists and songs.

Databases require a platform to communicate with the user and the rules of this platform define how one uses that database. This platform is called the user interface. User interface stand between the user and the database to translate commands from the user to the database and responses from the database to the user. Manovich defines an interesting point about interface database relationship;

> "The database becomes the center of the creative process in the computer age. Historically, the artist made a unique work within a particular medium. Therefore the interface and the work were the same; in other words, the level of an interface did not exist. With new media, the content of the work and the interface are separated. It is therefore possible to create different interfaces to the same material… In general, creating a work in new media can be understood as the construction of an interface to a database"[7]

1.2. Film & Art History Perspective

History of cinema begins with the technological issues around image recording and projection of it. To capture and project a moving image there were lots of technological developments required. The basic problems in this process of development can be summarized as follows; sequencial image recording, sound recording and projection of image and sound in a synchronized manner. Solutions to these technical challenges were developed by many photographers and scientists.

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[5] http://www.pandora.com/mgp.shtml May 12, 2007
[6] Pandora.com tag line, May 12, 2007
[7] Manovich Lev, *The Language of New Media*, The MIT Press, 2001

Here is a brief history of motion picture development; George Harver's optical device called Zoetrope (Figure 02) can be considered as the first step of motion picture development. From the vertical holes of rotating cylinder viewer watches a very short sequence of a horse running. The radius of the cylinder defines the length of a sequence and the rotation speed defines the Frame Per Second value of the moving picture.

Figure 02 - George Harver's Zoetrope

By the year 1879 Eadweard Muybridge achieved to photograph a sequence of a horse moving (Figure 02). His intention was never to create a moving image from photos but the concept of moving image was presented. George Eastman invented a device called Kinetograph in 1889 and this device is acclaimed as the first live motion picture camera. Then, Edison developed this machine and created an individual motion picture booth running with coins, called Kinetescope. Edison exported Kinetescope to European countries. In France, Lumiere Brothers were influenced from Kinetescope and developed a machine called cinematographe, so the film making started.[8]

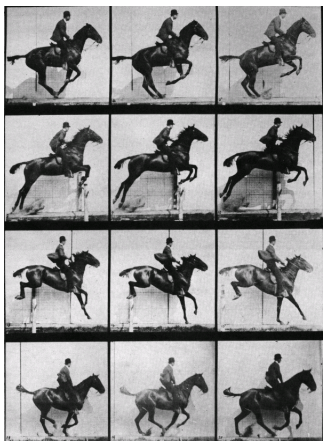

Figure 03 – Muybridge's study of a horse jumping

[8] Cook David, A History of Narrative Film, W.W. Norton & Company ress, 1996

Until the Lumiere Brothers, there were few basic problems in the development of motion pictures . First of all, the durations of exposures needed to be shortened for live capturing. This was solved through chemical developments in photography. Second, a medium was required to capture and store the images in a sequence. This was solved by the advent of filmstock. Third problem was projecting these series of photographs big, bright and fast enough for viewers to see in big halls. These steps lead the way from photography to the moving image and Movie Assembly project has a lot of common aspects with these intial steps during the invention of cinema. Instead of capturing the reality in front of the camera, now the problem becomes finding the right image. Like the long duration exposures of early cameras, finding the right image takes a lot of time but creating it with a digital camera requires a split second. Also sorting the images one by one is analogous to the second problem of storing images in a sequence as mention above. However projecting the final result is not a problem in Movie Assembly. In a way, Movie Assembly traces the creation process of early film making within the digital environment.

No work of art, design, film, etc. exists in a social vacuum. Every work communicates with other works in the historical continium. Movie Assembly project is no different. It has close relations with past art movements, primarily with Cubism. Early Cubist paintings represented multiple perspectives and viewing angles of the same object on the same canvas. Each visual study in Movie Assembly is also representing the different perspectives and viewing angles of the same object in the same moving picture. Early Cubist works divided the object into facets and segments and each part was organized on canvas to achieve a representation of the object. In Movie Assembly, the images are not divided to facets and segments, photographs are kept as originals (other than basic transformations like rotate, resize etc.) But each frame in a moving image can be considered as a different facet or a segment of the same subject. In Cubist painting the viewer is looking at a still frame with organized segments on a canvas but in Movie Assembly viewer is looking at a moving image in which segments are organized on a time line other than a canvas.

Cubist painting made certain sacrifices to contain detailed and varying viewing angles in a work. One of the sacrifices was the subject matter. As Edward Lucie-Smith

states; "*In a Cubist portrait, for instance, little or no comment is made about the personality of the sitter*"[9]. This feature of Cubist painting is similar to the moving image studies of the Movie Assembly project. The subject matter such as Eiffel Tower is not important, the photographs of the tower are just materials to build a moving picture and the main problem is creating a moving picture experience.

At the later stages of Cubism artists reversed the segmentation process. They represented the subjects by combining different materials like paper, fabric, wood, paint, and found materials like newspapers, book pages, cans, etc. Artists started to build compositions by adding and integrating different elements and this is called Synthetic Cubism. Movie Assembly acquires the addition and integration features of Synthetic Cubism. Each moving image is constructed with found material. Each study is like a collage made on a timeline. Basically the whole moving picture creation process is analogous to Cubism, only the timeline replaces the canvas.

The time concept combined with Cubism is also emphasized by David Hockney with his" joiner" photographs like in figure 04.

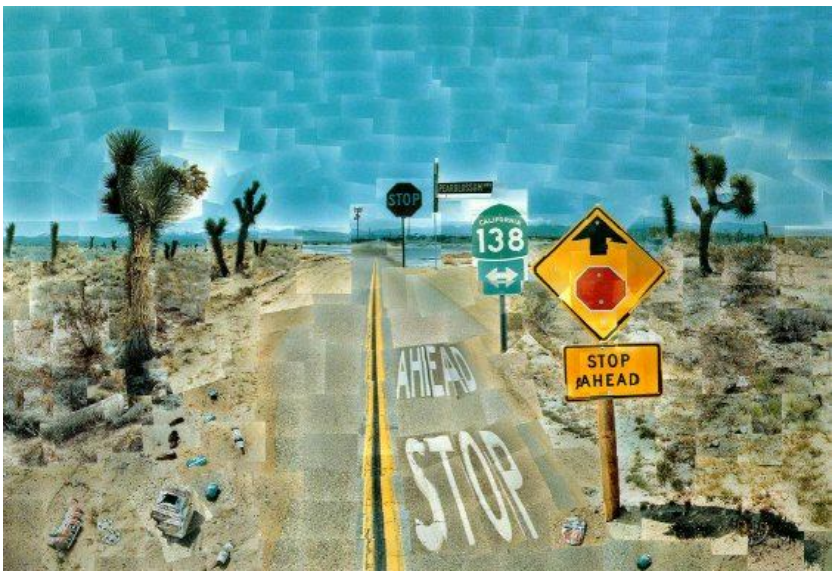

Figure 04 – David Hockney, Pearblossom Highway #2, 1986

In an interview about time issue Hockney mentions the following;

> "I had wanted to put time into photograph more obvious than just in the evidence that my hand pressed shutter and there it was…One extraordinary thing I discovered was that you can go on and on looking at these pictures, which is very unusual with photographs. However good the photographs, it doesn't haunt

[9] Lucie-Smith Edward, Visual Arts in the Twentieth Century Laurence king Publishing , 1996

> you in the way that a painting can. A good painting has real ambiguities which you never get to grips with, and that's what is so tantalizing. You keep looking back. A single eyed photograph can't have that quality. When you look back it is the same. But even though I'd made those joiners I still kept looking at them days later…There is a movement going on which keeps changing. It's a very complicated process. It's not just a number of photographs you look at. The combinations of pictures have much greater possibilities than that."[10]

Movie Assembly project is making a joiner moving image rather than a joiner photo. Every photo has its own time and perspective and most of the photos belong to different photographers. As Hockney states, from the viewers perspective, you want to look and look again to these moving images. In Hockney's joiner photographs, the viewer's eye travels through the images. But in Movie Assembly, the viewer is looking at a fixed frame and the images travel through her/his perception. Each photo stays enough on the screen for the viewer to follow the motion but not long enough to observe the photo completely and this tension forces viewer to watch again and again.

The collection of photos in a sequence resembles Monet's Rouen Cathedral paintings (Figure 05). Monet painted the Rouen Cathedral from the same perspective with the same composition many times. Each painting is a study of different lighting conditions. In Eiffel Tower studies lighting conditions change in each frame like Monet's cathedrals. Moving pictures do what Monet did with photographs on a time line.

[10] Joyce Paul, Hockney on Art Conversations with Paul Joyce, Little, Brown and Company, 1999

Figure 05 - The series of views of Rouen Cathedral painted by Claude Monet[11]

Movie Assembly project also has some aesthetic and conceptual relations with Futurism. The admiration of technology, movement, speed, etc. is also present in the Movie Assembly project. The whole project is in a way an admiration of features and social aspects of internet. Aesthetically the metro visual study has similar features to Futurist photography. Photographer Anton Giulio Bragaglia created many shots to represent the motion in photography, like in the following example (Figure 06).

[11] The details of paintings;

- Claude Monet: The Portal of Rouen Cathedral in morning light, harmony in blue. 1894. Paris, Musée d'Orsay
- Claude Monet: The Portal of Rouen Cathedral in morning light, harmony in blue. 1894. Washington, National Gallery of Art
- Claude Monet: The Portal of Rouen Cathedral (soleil), harmony in blue and gold. 1894. New York, Metropolitan Museum of Art
- Claude Monet: The Portal of Rouen Cathedral (soleil), harmony in blue and gold. 1893. Paris, Musée d'Orsay
- Claude Monet: The Portal of Rouen Cathedral and the tower d'Albane (soleil), harmony in blue and gold. 1894. Washington, National Gallery of Art
- Claude Monet: The Portal of Rouen Cathedral at afternoon. 1892. Paris, Musée Marmottan

Figure 06 - Anton Giulio Bragaglia , Change of position, 1911

Like the works of Bragaglia, metro visual study is made out of only motion blur photographs and those photos were sorted to create a moving image representing a machine in motion. The feeling of motion in photography is multiplied by the moving image experience.

1.3. Contemporary Works Related to Internet and/or Image Databases

a) Microsoft Photosynth (http://labs.live.com/photosynth/): *Photosynth* is about creating a 3D environment with related photos. So, a user can experience a place or an object via these photos. At the present time Microsoft is presenting a demo about San Marco square in Venice. A user can experience the square via this large collection of images, look around, zoom in and out, and find similar photos. Microsoft has not released this software as a commercial product. It is still under the development and as of May 2007 no release date is announced.

Photosynth and Movie Assembly have some features in common as each build on image databases and each is seeking for related images. But Movie Assembly uses a public database as its working environment and *Photosynth* uses a private one. Based on my experiences on *Photosynth* demo presentations, photos used in *Photosynth* look like they are shot from an identical camera. The exposure, recording time, lens distortion, etc. seem the same in each photo. However there is no explanation about the properties of their database. *Photosynth* aims to

create a virtual tourism experience, on the other hand Movie Assembly aims to explore film making using internet databases.

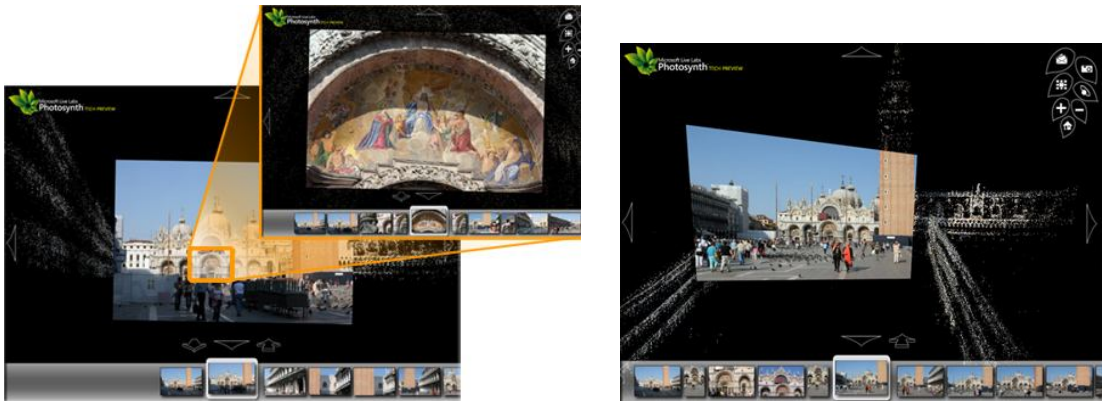

Figure 07 – Screenshots from Photosynth

b) Microsoft Live Local: Street-Side: http://preview.local.live.com/ : Briefly, *Live Local* is the combination of satellite photo maps and street side photographs. The web application presents the user as a car shaped avatar on the map and one can move around in the city with this avatar. A split screen in figure 08 shows the aerial map on the bottom half and the road photos on the upper half. Again *Live Local* is based on a photo database which is a common feature with Movie Assembly, but the primary aim here is providing location specific information. In their own words:

> "Historically, maps give you a perspective of geographical information about a place. In Windows Live™ Local, powered by Virtual Earth™, you've seen road, aerial, and hybrid maps. Then, we introduced bird's eye views to give you a perspective from above. Now, we want you to be there, right in front of the pizza shop you are searching for, in the street-side views offered by Windows Live Local."[12]

[12] http://preview.local.live.com/

Figure 08 – Screenshot from Live Local application

The database of Live Local is non-public and copyrighted. It is free to experience the service but images are not available to use in some other place or to be modified. Also uploading one's own photos is not possible. All these are significant differences between the databases of Movie Assembly.

c) **Photo Tourism:** http://phototour.cs.washington.edu/ Photo Tourism is a research project developed at Washington University, USA. Microsoft *Photosynth* is based on this research. Also the research team in this project collaborates with Microsoft Live Labs on *Photosynth*. The common and different aspects of Movie Assembly and Photo Tourism are the same as *Photosynth*, but in contrast to *Photosynth*, Photo Tourism uses images from *Flickr* similar to Movie Assembly. The official description of Photo Tourism states:

> "Photo tourism is a system for interactively browsing and exploring large unstructured collections of photographs of a scene using a novel 3D interface. Our system consists of an image-based modeling front end that automatically computes the viewpoint of each photograph as well as a sparse 3D model of the scene and image to model correspondences. Our photo explorer uses image-based rendering techniques to smoothly transition between photographs, while also enabling full 3D navigation and exploration of the set of images and world geometry, along with auxiliary information such as overhead maps. Our system also makes it easy to construct photo tours of scenic or historic locations, and to

annotate image details, which are automatically transferred to other relevant images."[13]

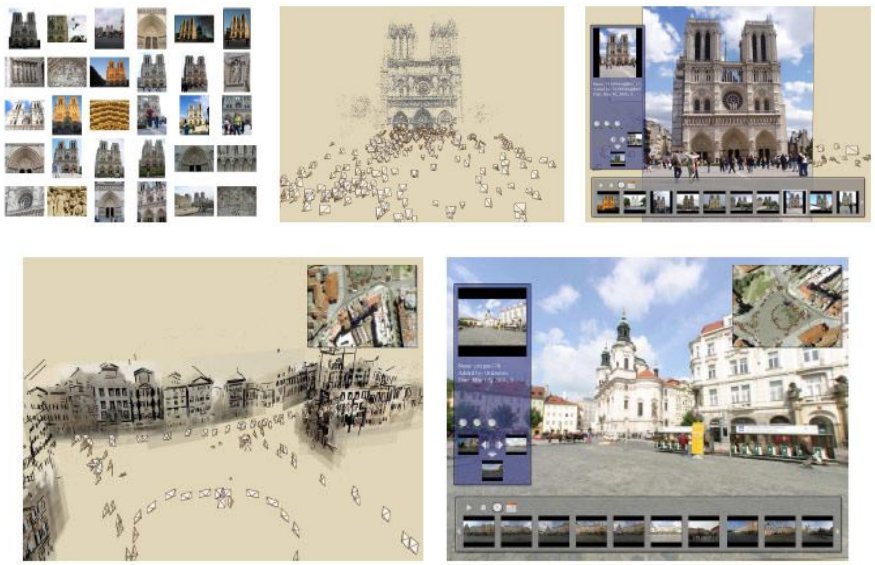

Figure 09 – Screenshot from Photo Tourism application

d) Ahree Lee, short film 'ME': http://www.atomfilms.com/film/me.jsp : This short film is also constructed on a photo database. Ahree Lee shot her face each day from November 2001 until 2004, then she compiled these images to construct the film. Movie Assembly and *Me* are in essence database films but the difference is Ahree Lee uses photographs that she created as a database and Movie Assembly uses a public one. Each film presents the aesthetics of image database film making, constantly changing color and light is common. In her film, the subject and the common visual element is her face which occupies most of the frame and the most noticeable visual anchor is her eyes. The position of her face is not changing. So, viewers do not have a hard time to follow the motion like in Movie Assembly.

[13] Noah Snavely, Steven M. Seitz, Richard Szeliski, "Photo tourism: Exploring photo collections in 3D," ACM Transactions on Graphics (SIGGRAPH Proceedings), 25(3), 2006, 835-846.

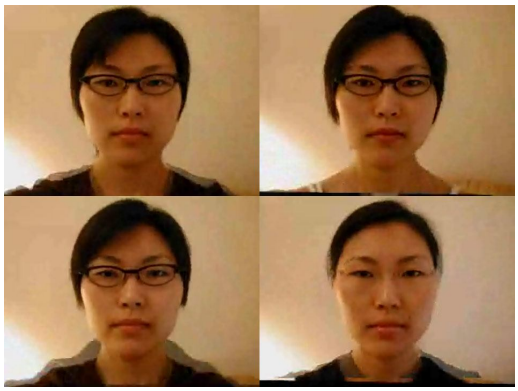

Figure 10 – Four frames from short film *Me*

1.4. Document to fiction

The project also has a "document to fiction" aspect. Most of the photographs that were used in the Movie Assembly project are tourist or amateur photos. These are documentations of other people, material artifacts of memories of tourists. Therefore the images are documents rather than artistic or fictional photos. And, I am collecting those documents to create my own fiction which is creating a virtual camera with a sequence of reframed images, with a particular duration and speed to deliver a moving image experience. I relate Manovich's following words with the Movie Assembly project, as Movie Assembly uses accumulated images to form a new experience:

> "The new avant-garde is no longer concerned with seeing or representing the world in new ways but rather with accessing and using in new ways previously accumulated media. In this respect new media is post-media or meta-media, as it uses old media as its primary material."[14]

Document to fiction, creating narratives from pre-existing footage is not a new approach to film making, *Atomic Café (1982,* The Archives Project*)* uses a collection of 1960s United States government films about the atomic bomb and its effects to make an anti-nuclear bomb film out of propaganda films that basicaly said atomic bombs posed no harm to US citizens. In *The Wild Blue Yonder* (2005, Werner *Herzog*), Herzog uses NASA footage to construct a sci-fi fiction. By narrating on documentary footage he alters the context of films. Another example is *Forrest Gump* (1994, Robert *Zemeckis*), where the visual effects department manipulated the archival footage of John F. Kennedy to present a living actor Tom Hanks next to him. The list can go on; the basic difference is, the above examples are changing the context of the document by

[14] Manovich,Lev, New Media from Borges to HTML ,The New Media Reader, edited by Noah Wardrip-Fruin and Nick Montfort, The MIT Press, 2002.

editing, narration and manipulation to create fiction. In Movie Assembly the context of photographs are not altered. The fictional side of Movie Assembly depends on creating a moving image experience out of photographs.

2. Process

2.1. Database Use

On the internet there are a lot of free photography sharing databases like sxc.hu, dropshots.com, fotki.com, webshots.com, photobucket.com, 23hq.com, flickr.com, zooomr.com, etc… Each web site allows users to upload their personal images and most of the images are open to the public. I chose *Flickr* for this project because of its popularity, size and tagging feature. On May 11, 2007, 19:36, UTC/GMT +2 hours the number of the images hosted by Flickr.com was 493,782,201 and this number is increasing each second.

The first step in my process was finding the images. It is a better practice to download images from *Flickr* to a local hard drive than viewing them on the web for this project. *Flickr* shows only twenty thumbnails per page and downloading full resolution of an image requires five clicks. Five clicks may not seem a lot, but as you deal with more then 100.000 images it means a lot of time and labor. The images on a hard drive can be sorted and scanned easily by image viewing softwares. *Flickr* does not support an official download software to download images, but supports a developer's kit to build 3rd party applications based on *Flickr*. There are a lot of free *Flickr* toys on the web[15]. Since these software are written by *Flickr* fans and do not have official support, each one of them have bugs and do not support enough functional features for my project. But based on my testing, *Flickr AutoDownloadr*[16] is the most suitable one.

The primary image set of Movie Assembly is photographs of Eiffel Tower, Paris, France. For that subject there is no unrelated tag problem. Eighty percent of Eiffel tagged images are actually related to the Eiffel Tower. There are more than 100.000 images tagged Eiffel on Flickr.com by April 2007. So the hard part is not accessing the images related to the subject, but finding the ones that will fit the particular sequence. As tags are user defined metadata elements to images and since

[15] Refer Appendix for a list of Flickr image downloaders
[16] http://flickrslideshow.fateback.com/

tagging provides contextual information about photos, the search results are more precise. By including more tags for the same search inquiry, the results can be sharpened. But the content of metadata in current technology is defined as vocal semiotics. And the context of each image is reduced to single word or a few words. For Movie Assembly project the weather and light conditions at the time of recording, the location of the camera, the lens type of the camera are essential. But this information is not accessible or present. So, all searching, selecting and assembly processes need to be done manually.

There are many image matching software that could be utilized. You give a particular image and the software searches for the images that look like the one you gave. I tried *imgSeek*[17] to choose adjacent frames on a timeline but image matching algorithms are not developed enough for such a problem yet. Instead of an algorithm the human eye has to do the image selection and sorting. So I had to try the selected images one by one to see if it is ok to put into the timeline.

To reduce the amount of labor involved in this process, different types of media formats which contain higher levels of metadata can be more usable. For example think about a digital photo file that contains data about geographical coordinates about where a photo was taken. Software can put images on a time line according to these data.

Movie Assembly project can be considered as an interface to an image database. Other than presenting individual images one by one on screen, it presents images to form a moving picture. It is hard to perceive a bombardment of images in a short time. Movie Assembly is also a bombardment of images, but as images has common visual elements and they form a moving image experience.

As each photograph in the *Flickr* database has different aesthetics in it, Movie Assembly's visual studies are a collection of these aesthetics. Each small moving image becomes a database of aesthetics. Also each photograph documents a different view of the Eiffel Tower in a different historical time. So the resulting moving image becomes a collection of samples from history, shrinking a big time span into a few seconds.

[17] "imgSeek is a photo collection manager and viewer with content-based search and many other features. The query is expressed either as a rough sketch painted by the user or as another image you supply." http://www.imgseek.net/ May, 2007

Making a film out of an image database is a never ending process. Because new frames can always be added and existing frames can be swapped with others. There is not a defined capturing time like in an actual camera recording situation and the "capturing time" or cinematography in a way continues as the project goes on. Someone else is constantly capturing and making images available on a database. As the database gets bigger and bigger the chance of creating smoother motion is increasing. With time, the moving picture experience can be enhanced.

2.2. Sharing – Collaboration – Creative Commons – Movieassembly.com

In essence this project is a collaborative one. Collaboration takes place, although without them knowing, with the creators of the photographs, image taggers and Flickr.com employees. Movie Assembly project is also looking for collaborators for the film making process, such as image collectors-sorters. So far five people have expressed interest in joining the project, but they are yet to provide any input. Internet users are building and adding value to web databases. Without users creating and uploading content, most of the web databases will loose their potential and importance. In other words people who have access to it are running the internet, everybody can participate in the growing structure of the internet. In such an environment looking for collaborators for a web based project is more suitable for the nature of the web.

Collaboration between the project and the creators of database photographs requires clarification of copyright issues. In traditional copyright, using a part or the whole of the content, requires permission from the copyright owner. Now "Creative Commons" offers an alternative approach to copyright. "Creative Commons licenses give you the ability to dictate how others may exercise your copyright rights—such as the right of others to copy your work, make derivative works or adaptations of your work, to distribute your work and/or make money from your work. It provides free tools that let authors, scientists, artists, and educators easily mark their creative work with the freedoms they want it to carry."[18] So, the creative process on the web becomes faster without paperwork and negotiations of copyright procedure. Creative people have more freedom to experiment, produce and share.

[18] http://creativecommons.org/ April 30, 2007

Creative Commons (CC) web site also supports a search engine that gathers CC licensed content. With this search engine you can search for works you can use for commercial purposes or works you can modify, adapt, or build upon. Traditional copyright is gradually replaced by Creative Common Licensing on the internet. Major web sites like *Flickr*, *Deviant Art*, etc. are supporting the CC license.

In Movie Assembly most of the images are licensed with CC. That makes the Movie Assembly automatically CC licensed because of Share Alike feature of CC. "If you alter, transform, or build upon this work, you may distribute the resulting work only under a license identical to this one."[19]

In January 2007 Movieassembly.com web site is launched. The main purpose of the web site is sharing the concept, building a showcase for the visual studies and seeking collaborators.

Movieassembly.com logo in figure 11 resembles a timeline built with film frames and the green frame symbolizes the integration of other frames to the film. The font used in Movie Assembly logo is a sans serif, round cornered one[20]. This type of font integrates with the shapes over the typography.

Figure 11 – Movie Assembly logo

2.3.Script

There is a simple script for the film but it is hard to call it a scenario in the narrative sense. It is more like a series of motion studies. The main idea is to give a

[19] http://creativecommons.org/ April 30, 2007
[20] This font is Freeware, NATIONAL FIRST FONT is Copyright [c] Roger White

view of the Eiffel Tower with a scene from the city, not to tell a story. Right now I am at an early stage, in a way similar to early works of Lumiere Brothers. I am trying the possibilities of image database film making.

The visual source library for the film is limited to the content of the images in Flickr.com. You can find thousands of images of famous places, birthday parties, babies, weddings etc. but if I want to create a moving image about a sci-fi facility on a desert I can hardly find a few images. So I am limited to popular topics on Flickr.com. The situation gets complicated if I want to present an actor. When I think about acting and continuity then it is virtually impossible to find that many images of a person, that would create plausible moving image.

All visual studies done in the Movie Assembly project are initially silent films. The sound or music was not an issue during the construction process.

2.4. Sequence Construction

Sequence construction is basically just putting frames after frames. I use Adobe Flash 8 for this process, because the 'onion skin' feature of this software allows one to see previous and following frames in low opacity. So, it helps a lot in positioning the image for smooth moving image experience. To create a smooth camera movement, applying basic transformations (scaling, rotating, and flipping) to photographs is essential. Also reframing is common to maintain continuity between frames. But I do not apply any other effects like color modification, photo-manipulation, digital painting etc. I had to try each photo one by one to see if it is suitable for the particular sequence. It took a lot time and patience to build few seconds long moving image. Each visual study is no longer than 3 seconds which means, less than 36 images. These 36 images are selected from a tiny 400 image folder on a local harddrive. These 400 images are collected from *Flickr* databases from related tag image pools. Through this process I looked through more than 120.000 images from Flickr.com

To maintain visual continuity between frames for the viewer setting a visual anchor in each frame helps a lot. Figure 12 shows the frames of visual study 01. Eiffel Tower is the only dominating graphic element in each frame but the visual anchor is the

negative space in the middle. Eye follows the common negative space through the timeline and can perceive the camera motion easily.

Figure 12 – Frames from visual study 04

I mainly used 12 fps setting for the visual studies but my experience showed that 8 fps is also suitable, faster than 12 fps creates a really fast moving image that perception of each frame gets lost, only the visual anchor is possibly perceived.

The main working frame is 720x576 pixels, which is the Pal DVD standard. Portrait oriented photos are harder to place in a 720x576 pixels frame and images larger than 720x576 resolution are necessary to avoid black regions on film. But these higher resolution images (larger than 1024x768 pixels) are harder to find on Flickr.com

3. Visual Studies

First of all visual studies were done to see if the idea is feasible. Secondly I tried to build different virtual cameras like; zooming camera captures a steady environment, moving camera captures steady environment, steady camera captures a moving environment and steady camera captures a steady environment. Each visual study raised its own set of questions about how to assemble images and what the next step can be.

In Movie Assembly project, each visual study is an edited sequence. Each photo at short durations (1/8 sec. long) are theoretically short films and by placing one after another on a micro level I created the sequences. In metro train arriving sequence (visual study 11.2), each photo is contextually related but totally different from each other. Assembling photos form a superior meaning to their individual context. As in the

"Kuleshov experiments"[21] the combination of images are more important than the content of each individual image.

i) **Visual Study 01:** The first study was made with 23 images of the Eiffel Tower. Moving image is running at a speed of 12 fps. Since this was the first study, the main goal was to test the feasibility of the project, to create a virtual camera. Each frame is organized around the visual anchor of the tower and since the image sizes are not suitable for the current frame, there occurred black areas on some frames (Figure 13). These black areas disturb the eye and affect the perception of the viewer. So, the best solution was to find full frame images for each frame of the video for the next study.

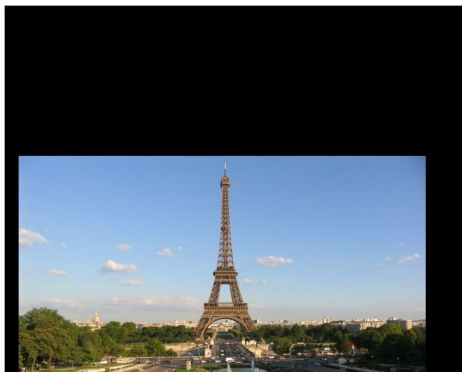

Figure 13 – Black areas on frame

ii) **Visual Study 02:** Made out of 25 full framed and re-framed images of the Eiffel Tower at a speed of 12 fps (Figure 07). The goal was to extend the duration of the study and achieve a smoother camera movement. Instead of anchoring the full figure of the tower, I concentrated on the negative space of the second level. To maintain continuity, re-framing is essential as the position of tower is not same in all photos. I am in semi-control of re-framing because the adjacent frames decide how the new image is going to be re-framed. Re-framing happens as I orient the common visual element in each frame and consequently the eye follows the common visual element through the timeline. As the camera is moving away from the tower, it is

[21] Kuleshov edited a short film and placed a woman looking at a plate of soup, a baby, a coffin. Each time viewers get different emotions from the woman's face like hunger, desire, grief respectively. But the footage with woman was identical in each edit. So he states editing is a basic tool for film making and assembling of different shots creates the film.

getting harder and harder to anchor the common visual of the tower. This is because of the varying shooting locations (vantage points) and the size of the tower in the images. Also each frame of this study has different light and lens conditions (focal length and depth of field effects). By adding more frames to the timeline it is possible to extend the duration, but as you add more frames it is getting harder to find suitable images. Because each added frame limits the following frame. Color and atmosphere changes add a different kind of aesthetics to the moving image. The camera movement in this study was a straight forward process, I collected same angle and varying distance shot images of the tower. The next step was trying new camera angles on the Tower.

iii) **Visual Study 03 - Workspace:** This was made with 25 full frame images of the Eiffel Tower at a speed of 12 fps. The goal of this study was to give inside information about how previous studies are made and present this film at Movieassembly.com. This time each frame is shown by its original size, without re-framing (Figure 14). This led to a different aesthetics than the visual study 02. Since we are able to see the original content of the images, it is now easier to identify those images as tourist pictures. The tower remains as a visual anchor in this sequence. This also demonstrates that during this process re-framing helps a lot to the viewer to keep the consistency between frames. Varying frame sizes and positions make moving image experience complicated. I am planning to keep the following studies in defined frame size.

Figure 14 – Workspace

iv) **Visual Study 04 – Moving Camera:** This is a slightly extended version of visual study 02. More in between frames are added. This study also shows us

that this kind of film making is a never ending process, as long as you have the suitable image you can always add, drop and change the individual frames. These operations will change the speed of film but will not affect the base idea. Also, in this study we are able to see more than 30 different light, lens, and environment conditions of the same structure, the Eiffel Tower. So we are dealing with huge amount of data in a short time period. This data flow can be considered as data visualization. Film becomes a way of data visualization. Of course in that short time frame it is very hard for human perception to receive that much information. In other words, information is overloaded in a short time period. Reducing fps of the study will eliminate this overload, but the smoothness of camera will be discarded. Visual studies from 01 to 04 are based on same type of images, the next step was trying to create different moving cameras.

v) **Visual Study 05.1 - Camera from legs to open view:** This piece aims to give a feeling of a moving camera from under the tower to the front of it. In this piece the major problem was the size of the original images. Since this shot is suitable for portrait orientation most of the *Flickr* users took the picture vertically. But our frame is in landscape orientation. So there occurred a necessary re-framing to keep everything in the frame. And this re-framing makes it harder to perceive the camera movement. Film is not successful enough to communicate as a moving camera. This yielded itself to the following study which shows full frames of the moving image (Figure 15).

Figure 15 – Camera from legs to open view

(1) Visual Study 05.2 - Camera from legs to open view (Full frames): The goal of this study is to create a better camera movement for visual study 05.1. To achieve this I extended the frame large enough to see the

full photographs (Figure 16).So, camera movement is much cleaner than the previous study. Because now we are able to see the rest of the tower. The top point of tower helps the perception of movement. However without standard framing now it looks like the tower is animated other than filmed.

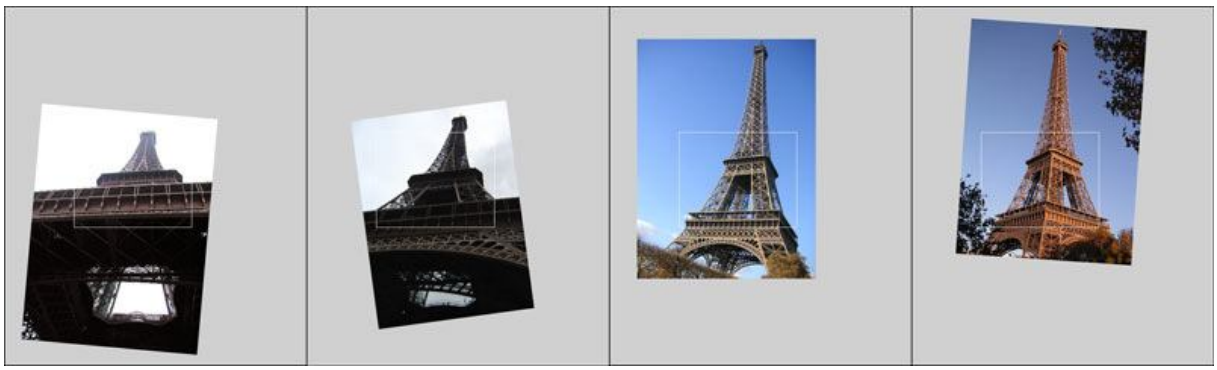

Figure 16 – Camera from legs to open view (Full frames)

(2) Visual Study 05.3 - Camera from legs to open view (Full frames stacked): This study is a slightly modified version of the previous one. Instead of changing the image in each frame, I worked with layers. Each following image is placed on upper layers (Figure 17). So, keeping the previous frame in layers on the screen makes it harder to follow the movement of camera. Visual study 05.2 is a better solution to give the feeling of a moving camera but this piece has something different. First, it reflects the process of film making. And there is a tension between still images and moving picture. Each image appears on screen and stays there, some part of the image keeps changing with the new frames but some part of the image stands there until the end of the sequence. A duality occurs between moving and still images. We become more aware that each frame is a still image in movies, and that the whole moving image experience is an optical illusion. From here on I experimented with abstract studies to see if it was possible to build abstract moving images with found photos.

Figure 17 – Camera from legs to open view (Full frames stacked)

vi) **Visual Study 06 - Arc:** In this study, the goal was to build a stationary camera which is pointed at the arc of the tower (Figure 18). In the *Flickr* image searching period I realized that it is very hard to find images that were taken from the same distance and angle. I was not able to realize my first intention. Also on Flickr.com, the arc of the Eiffel Tower photos are not that many compared to other abstract re-framings of the tower. It seems like people are not interested in this type of images. In my opinion, it is because arc images are not characteristic of the Eiffel Tower. Since most of these images are tourists' photos, they want to capture the well known representations of the tower. Collective memory is taking a remarkable role in the re-recording of famous places or monuments. People want to take pictures as they remember from other photos, films, books, etc. I decided to use other parts of tower for upcoming abstract studies.

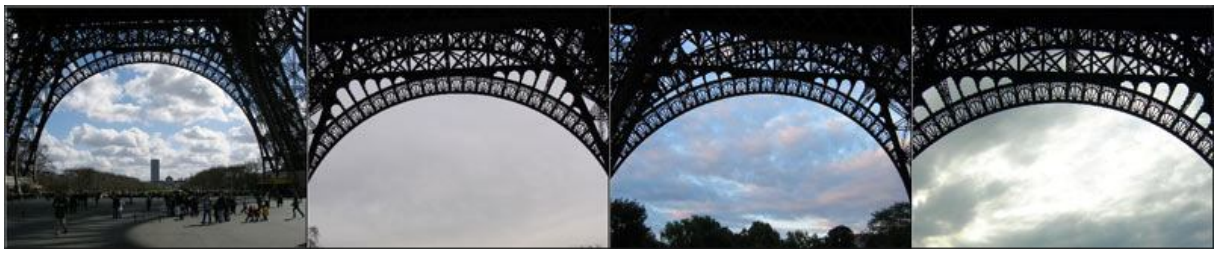

Figure 18 – Arc

vii) **Visual Study 07 - Abstract metal structure:** In this study, the goal was to build an abstract study based on Eiffel Tower images. I wanted to try and see what will happen if I just sort the images one after another without worrying about a virtual camera and visual orientations. All pictures are re-

framing of Eiffel Tower leg details (Figure 19). I tried to loose the identity of Eiffel Tower but since the image of it is so powerful in our minds some frames are easy to link with it. This study is showing the contrast between visual anchored and non-anchored films. Non-anchored ones like this, is more like an image bombardment on screen, hard to follow and perceive. I am planning to use this piece in the final montage. The next step was more experimentation on abstract visuals but with common visual anchor in them.

Figure 19 – Abstract metal structure

viii) **Visual Study 08.1 - Abstract square:** I was not satisfied with the visual study 06 and the need for common visual anchor in study 07 led me to this study. This study was an answer to the both problems of studies 06 and 07. The square view from under the tower is abstract enough and serves as common visual element (Figure 20). The bottom center view of the Eiffel Tower is mostly photographed from the same location and same distance. So, collecting, selecting and placing each frame were very easy in this study.

Figure 20 – Abstract Square

ix) **Visual Study 08.2 - Abstract square extended:** The goal of this study was to add a motion dimension to the previous study. Each frame is rotated clockwise 15 degrees relative to the previous frame. The result is a dazzling rotating abstract square which is made out of Eiffel Tower images (Figure

21). This is the first study that can be considered as fully animated. Two dimensions of motion is in effect, one is the changing frames and the other is rotation. So the moving image experience becomes more complicated and surprising, because of the motion it is harder to identify the images as a part of the Eiffel Tower. From this point on I wanted to experiment more with adding motion to the frames.

Figure 21 – Abstract Square extended

x) **Visual Study 08.3 - Abstract square extended (Full frames stacked):** Since the images are in landscape format rotating ones leads to negative spaces in previous study. To eliminate those negative spaces and experience the stacked version of visual study 08.2, this study was assembled (Figure 22). Since every photo is in rectangular form it creates a contrast between rotating square and rectangle photo frame. But after completing the first cycle rectangles form a non-uniform circle. The rotation of the square is an artificial movement. It is not related to the visual features of photos but only to my decision. From here on I wanted to experiment with adding artificial motion to the frames in virtual camera related studies.

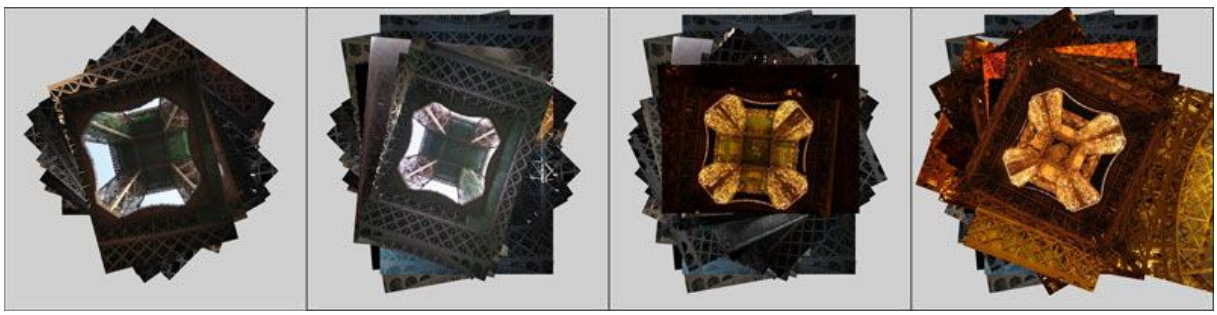

Figure 22 – Abstract Square extended (Full frames stacked)

xi) **Visual Study 09 - Moving camera experiment:** The goal of this study was to experiment the rotating frames as in visual study 08 in a non-abstract Eiffel Tower image sequence. Every study requires a visual anchor to help the viewer to follow the motion. In this one I defined my visual anchor as the top point of Eiffel Tower and the images are rotating from that anchor point (Figure 23). The moving image experience is graphical than cinematic. We see rotating and approaching tower but it is hard to say that this is captured by a (virtual) camera. So this study is out of scope of the project.

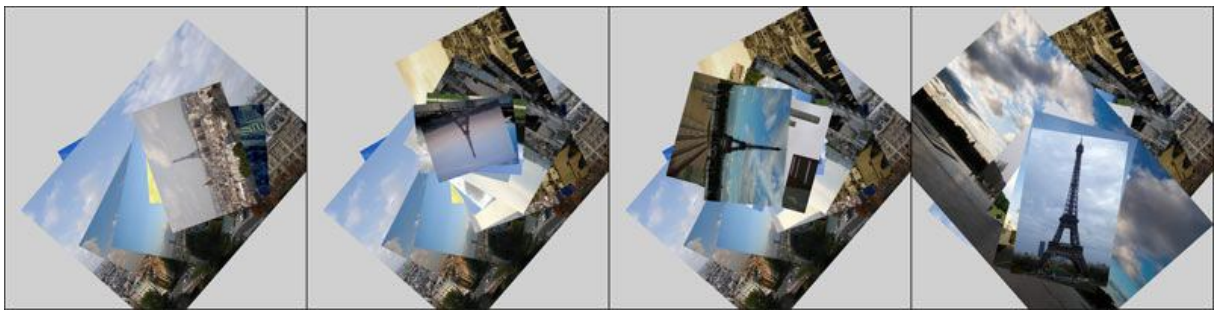

Figure 23 – Moving camera experiment

xii) **Visual Study 10.1 - Moving camera with motion:** I believe visual study 09 is a failure but I still wanted to try the artificial camera movement from visual study 08.3**.** This study is a modified version of visual study 04. Camera shifts left and right while zooming and this effect is achieved by changing the location of the frames on x-axis accordingly (Figure 24). Moving left and right adds another dimension to the moving image experience. Following the visual anchor in film become more complicated.

Figure 24 – Moving camera with motion

xiii) **Visual Study 10.2 - Moving camera with motion (Full frames stacked):** This study is the full frames version of the previous one. Seeing

full frames of previous study makes the effect more dramatic. The eye still can track the Eiffel Tower under this heavy image bombardment (Figure 25). Compared to visual study 09 this full frame version is more natural for the viewer because of its closeness to cinematic conventions. Rotating cameras on the z-axis are rarely used in cinema. But shifting on y or x-axis cameras are widely used. However since we are unable to see the sides of Eiffel Tower the visual experience looks artificial or animated.

Figure 25 – Moving camera with motion (Full frames stacked)

xiv) **Visual Study 11.1 – Metro:** The goal of this study was to create a steady camera capturing a moving environment. The subway train comes to the station and goes by. Since most of the frames are blurry photographs, the whole video is a demonstration of speed, similar to art of the futurist period (Figure 26). Also this study has black and white frames. But the viewer does not register them at 12 fps. The attention is on the lights and the motion of the train. The train and the train station is different in each photo, New York, Paris, Prague, Seoul, etc. are some of the cities and subways pictured. The train and the environment changes but the motion is present. It is harder to find images of trains just at the entrance of the station. For that reason this study is similar to visual study 06 in which I was experimenting with arc images. Both examples demonstrate that some kinds of compositions are not perceived as interesting to photograph. This observation shows us that taking photos and film recording have different motivations. Photographers are mostly interested in composition and stand alone “good looking” frames but film makers will gladly record the very beginning of train arriving at the station. I believe this is an interesting point because it emphasizes the differences between moving and still images. In addition to that I am using

blurry still images, which are trying to take objection to their still nature, to build a moving image. In image database film making, if the composition is not popular among the photographers you are more likely to lack the necessary in between still images.

Figure 26 – Metro

xv) **Visual Study 11.2 - Metro extended:** This is an extended version of the previous study, more frames added. Train comes and passes through the station. We are able to see the arrival and departure of the train. This study is more than a steady camera. The camera captures the arrival of the train and pans right to see the departure of the train. I am also repeating blur door sequence for 3 times to resemble the repetitive nature of train cars passing through the station (Figure 27).

Figure 27 – Metro Extended

xvi) **Visual Study 12 – Horizon:** This visual study is about capturing a fixed distance from a steady camera like in visual study 08. Here the fixed distance is the endless horizon and center of gravity in photos is the center of

them. The vanishing horizon is used as common visual element here (Figure 28). But since the images are so much different from each other, it is hard to perceive the moving image as I described. It is more like an image bombardment on the screen and the viewer has a hard time to relate the frames to each other to perceive the piece as a whole moving image. It is more like a discrete image sequence. This study emphasizes the importance of common visual element in each frame, without it we are having hard time to follow the motion picture.

Figure 28 – Horizon

4. Assessment & Conclusion

Integration of and interactivity with databases is getting more and more exciting with internet databases. Until the advent of digital technologies, we have been used to linear-narrative entertainment and art forms, like cinema, theater, music, literature, fine arts, etc. But now we are experiencing non-linear non-narrative art and entertainment forms. For example *Last.fm* is only a database holding information about our music choices, but we are spending hours by looking at other user's choices, we build social networks, discover new music and discuss about music. Not the music itself but the size of and the interaction with the database make it enjoyable. The same point applies to most of the major databases like *Flickr.com, Deviantart.com, Youtube.com, MySpace.com,* etc.

Also, access to information is easier and faster than ever. From *YouTube* you can watch 1920's avant garde films which were very difficult to access with analog technologies, from *Wikipedia* you can access any kind of useful information without leaving your home. Accessing information via the web makes people more aware of what is going on in the world. We can view independent news sources, personal blogs as alternatives to the mainstream media. This list goes on and on. The web delivers

massive amount of information to people who have access to it. Also with the mobile technologies these databases are ready to go with us anywhere. We can experience them while traveling, outdoors, etc. This makes the web more addictive and powerful.

In the 19th century the problem was recording the visual world. Painting was present but still and moving images were in development. Then, we solved the problem with cameras. Much later, video technology brought cheaper and convenient devices, and then the problem became how to store that much footage. Archiving magnetic tapes required a lot of money and space. Digital technology changed the way of capturing and storing. Capturing is cheaper with digital cameras, more flexible with small mobile devices and stored data is larger then ever. We can store thousands of hours of footage in a book-size harddrive. And now the problem is how to access the desired data. Overwhelming databases are beyond human perception. For example, The Shoa Foundation, which was established during the development of the film *Schindler's List* (1993, *Steven Spielberg*), was conducting video interviews with Holocaust survivors and the scale of the resulting archive is described in these words: "it would take one person forty years to watch all the video material, stored on Foundation's computer servers."[22] We are living in a massive information era but this does not mean that we are able to search and scan that much information effectively. To be able to do that, we need different file types to construct different databases and interfaces.

Movie Assembly is not the only database collaborative film making project on the web. There are many examples. *Yourbroadcaster.net* is another web site dedicated to collaborative film making via the internet. They are planning to build five feature films in categories that include Bollywood, horror, thriller, drama and comedy. Users can add pictures, photographs, videos, audio and documents. There will be a constant voting process for the present content so the film starts to be built with the highest rated materials. Another collaborative project is *Opensourcecinema.org*. The aim of this website is to make a documentary about copyright issues in digital media. Users can create and send their original media and can edit existing footage for review. A more focused web site is *Plotbot.com. Plotbot.com* is a collaborative screenplay writing network. You can set your screenplay as private for a small group of collaborators or public as open to any registered user on *Plotbot.com*. All these websites are now testing

[22] Manovich Lev, "Metadating" The Image, manovich.net, February, 2007

the possibility of collaborative production on the internet. Time will tell if this type of working model will survive. But the internet is changing our perception about copyright like Creative Commons, creative process like collaborative online projects, socializing like networks.

In the future, I suppose that the computer can take place of human labor in the Movie Assembly project as web databases become much much bigger. Then, a user has to define only the parameters of the moving image. For example, a user can define the mood of Eiffel Tower images like cloudy, foggy, energetic, dark, gloomy, etc. So, other than assembling content, the manipulation of it will become more important. Since databases are constantly changing environments, each time a user will assemble a different moving image. And if the database will store this edited final film like algorithms other than read-only data, each time the viewer will experience a different film according to creator's parameter settings.

More and more databases are merging into our lives with social networks, satellite maps, image-video sharing, etc. and each one comes with effects on various fields like in art, such as online exhibitions, web based collaborative art projects; in marketing such as profile driven focused advertising like *Google Adsense*; in education, such as distance learning programs, academic paper databases; and in lifestyle, such as social networking… This study is a tiny example of what image databases bring to the practice of filmmaking and to the aesthetics of moving images and the way we perceive the internet.

APPENDIX A

Flickr.com image downloaders:

- FlickrDown: http://greggman.com/pages/flickrdown.htm
- Flickr Backup: http://sourceforge.net/projects/flickrbackup
- Flickr AutoDownloadr: http://flickrslideshow.fateback.com/
- FlickrFavs: http://www.isaias.com.mx/flickrfavs/
- Flickr Buddy: http://www.isaias.com.mx/flickrBuddy/
- Flickr Explorer: http://sourceforge.net/projects/flickrexplorer/

Online Photosearch engine:

- http://yotophoto.com/
- http://go.beholdsearch.com/searchvis.jsp
- http://www.forestandthetrees.com/findr/findr.html (searchs flickr)

Online image matching search engine:

- http://www.tiltomo.com/ (flickr)
- http://labs.systemone.at/retrievr/ (flickr)

Online Free Photobases:

- http://www.sxc.hu/
- http://www.freefoto.com/index.jsp
- http://www.morguefile.com/
- http://www.stockvault.net/
- http://www.freephotosbank.com/

Downloadable image search engines:

- http://www-i6.informatik.rwth-aachen.de/~deselaers/fire.html
- http://www.imgseek.net/
- http://en.wikipedia.org/wiki/Content-based_image_retrieval

APPENDIX B

1 CD-ROM

Presentation Film

Web Site