Analysis of different photographic techniques in the graphic representation of an architectural space.

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1 INTRODUCTION

1.1 Origin TFG

This project stems from my love of architecture, and the way they describe through photography.

After years of visiting and meeting spaces and try to capture them to teach the best and most complete way, noted that it was difficult to create visually appealing images of these spaces, but however if it was very difficult to explain in a real way. By this I began to think and look for methods and tools to help me explain these spaces, complementing traditional architectural photography.

This project is the search for a working method for the current applications of architectural photography. A method that allows us to document a space in the most accurate and attractive as possible.

A study on what are the best tools and techniques that allow us to get closer to the reality of an architectural scene.

Were used at least two spaces for the study, one to learn different work processes (CITM / UPC Terrassa) and another to apply these processes in a contemporary building (L'Atlàntida Vic).

Will attempt to represent these spaces with the use of various techniques, and trying that overall there is a maximum possible information of architectural space and their uses.
1.2 Objectives TFG

The main objectives of this project could name three who are the core of it, we would be talking about the analysis of different mapping techniques in the image of architecture, the study of the preview and pre-production perspective architectural photography and finally key management tools and processes for carrying out photographic images of architecture.

Although in reality these three objectives can be summarized into one master, and that is the engine of the project, as we have said before: find a working method that allows us to document a space more accurately and attractively as possible.
2 CONCERNING

2.1 Concerning the description of space photography.

As major figures in photography of description spaces I had to when looking for inspiration for this project I would like to highlight Gabriele Basilico, Ezra Stoller, Candida Hofer, Duccio Jesus Malagamba and Granada.

Gabriele Basilico (1944-2013)

Italian architecture photographer, architect by training, spent much of his career to observing and photographing his hometown, Milan. He specialized in large cities, and show their deep and constant changes. It is and has been a teacher in the management of visual obstructions, and outlook leak will use when describing a building or an architectural space.
Ezra Stoller (1915-2004)

American architectural photographer. Bachelor of Industrial Design from the University of New York, then studied architecture but abandoned them to get started in professional photography.

He has been a photographer for head of many great architects, and became one architectural photographers in the world has been one of the great architectural photography specialist in the history of photography.

He uses his technical precision and chiaroscuro to show what he called ‘the idea of building’.

© Ezra Stoller 2.4

© Ezra Stoller 2.5
Candida Höfer (1944- )

German photographer studied at the Academy of Fine Arts in Düsseldorf and photography as a student after Bernd Becher. He specializes in photographing interiors of public buildings, almost always takes pictures front, with a single central vanishing point.
Duccio Malagamba (1960- )

Italian architecture photographer. Degree in architecture at the University of Genoa. He received a scholarship from the Italian National Research Council to carry out a study of contemporary Spanish architecture. For this investigation resumed his interest in photography.

Currently is the most important photographers worldwide. His work is characterized by working a series of images, forming a story with all of them.
Jesús Granada (1973-)

Andalusian architectural photographer. He graduated from the School of Architecture of Seville, and later began operating as a professional photographer doing reports for publishers, institutions and architects.

This is one of the most renowned Spanish photographers current.
2.2 Origins and evolution of photography space description.

Architectural photography has its origin in the pictorial image. Before photography, architecture was represented by artists in their paintings, images of architecture found in all styles of painting.

The first images taken by Nicéphore Niépce made by Louis Daguerre and can be considered as architectural photography. Throughout the history of photography, buildings have always been highly valued as photographic subjects. During the 1860s, architectural photography started to become widespread in the visual medium.

In the mid 1920s, architectural photography became more creative, and begin to use new resources as diagonal lines and shadows in your images, among other innovations as key elements to highlight.

In the 1950s, it is common for architects hired photographers to document their works in the new being the origin of the current architectural photography.
2.3 Renowned architectural photographers of the twentieth century:

**EUGENE ATGET** (French). Photography Urban neighborhoods of Paris. He used the camera with glass plates and she performed corrections perspectives when shooting.

© Eugene Atget 2.15

**BERENICE ABBOTT** (American). He worked in France with Man-Ray and Eugene Atget knew of who shared the photographic style. "Changing New York" is a photographic record of the changes that were being developed at that time in that city.

© BenericeAbbott 2.16

**WALKER EVANS** (American). He worked for the FSA (Farm Security Administration) a program that attempted to document the plight of rural communities in the U.S. during the depression. Photography and poor folk architecture.

© Waker Evans 2.17
AUGUST RENGER-PATZSCH (German). In the field of architectural photography can highlight the photo book entitled "The world is beautiful", a graphic document on urban and industrial spaces.

© August Renger-Patzsch 2.18

BERND Y HILLA BECHER (German). Conceptual Art. Typologies studies and systematic documentation of architectural structures. His work relates to the New Objectivity movement. Photographing industrial structures, building typologies (or gas reservoirs, coal silos, blast furnaces, houses, etc.). Do not change anything of the photographed object, just isolated.

© Berd y Hilla Becher 2.19

ANDREAS GURSKY (German). Photography very large spaces, where man is a tiny element. Photos are very large (2 meters) and rich in color

© Andreas Gursky 2.20
THOMAS STRUTH (German). A student of Bernd and Hilla Becher. He began photographing empty urban landscapes, which led him to be widely recognized.

© Thomas Struth 2.21

SERGIO BELINCHON (Valencia). With her pale, ghostly developments photographically documented the brutal colonization of nature. It provides a record of the ephemeral urban landscapes that have emerged in recent years on the Spanish coast.

© Sergio Belinchon 2.22

OLIVO BARBIERI (Italian). Aerial photos of monuments such as the Pantheon and the Colosseum, using Scheimpflug technique, with the giant getting that element blurs seem small by presenting.

© Olivo Barbieri 2.23
3 PRE PRODUCTION

3.1 Select equipment and work processes

The first major decision of the project was to select the equipment you would use to try to show the spaces in the most accurate and attractive as possible.

After long research and look for the best options I had as I decided tools or processes for a number of these. Given the economic budget was available for the TFG and the knowledge we had of the different processes.

Finally we decided to work the following processes:

- Photography of traditional architecture
- Photography HDR (High Dynamic Range) and tone mapping processes (LDR)
- Panoramic Photography
- Photography 360
- Time Lapse

I have chosen these options because each brought me something different from the others, and among all document allowed a more comprehensive architectural space.
3.1.1 Standard Photography. Description of the method.

When taking photographs of architecture we have a few aspects in mind to take pictures that are as good as possible.

These are:

Viewpoint: Here we decided mainly the translation of form and perspective description of the image. An image radically change if you change your point of view, is one of the fundamental decisions we take.

Composition: This is the organization of the elements of an image. This aspect has to do with the aesthetics of the image and the visual pathways between the different elements of the image.

Visual obstructions: closely related to the previous point, visual obstructions architecture usually streetlights, cars, trees, lights, and many other urban elements that if not "placed" in the right place can interfere negatively in the composition and graphic documentation of a building or architectural space.

Choosing lighting: It is basic in architectural photography. Choose the lighting (natural or artificial) most appropriate for the description of the scene that we propose. It should take into account aspects such as building materials, orientation and use.

Image sharpness: Also another thing to control. Normally in architecture to work with the elements over long distances, no problems of sharpness or depth of field.

Camera angle: we must also take care of the position of the camera relative to the ground and the building. Buildings almost always have their walls perpendicular to the ground, so to get save images without distortions and subsequent correction in software, we put the camera perpendicular to the ground (photographs picture plane vertical) also whenever possible.

Tripod: for this type of photography tripod is often used for several reasons, the first to compose more calmly and correctly, and the second to avoid problems of trepidation when we need to slow exposure times.
3.1.2 Photography HDR / LDR . Description of the method.

The images of high dynamic range (HDR) is a process that enables better dynamic range of luminance between the lightest and darkest areas of an image. This wide dynamic range allows HDR images to more accurately represent the wide range of intensity levels found in real scenes, when this range is greater than we can control with the current camera sensors.

The tone mapping techniques allow us to visualize an HDR image in our devices (screens) and current reproduction systems.

Brief description of the History of Photography HDR / LDR:

1850
Using multiple exposures to repair a luminance range was too great pioneer of 1850 by Gustave Le Gray to show both the sea and sky in marine pictures. Le Gray used one negative for the sky, and one with a higher exposure to the sea, then combining the two into a single positive image.

1980
The desirability of HDR has been recognized for decades, but its wider use was, until recently, excluded by the limitations imposed by the processing capacity of current computers. Probably the first practical application of HDR was the film industry in the late 80s and, in 1985, Gregory Ward created the image file format RGBE of Radiance, which was the first (and still the most commonly used) HDR image format.

1996
Steve Mann developed and patented the global-HDR method for producing digital images having a wide dynamic range at the MIT Media Lab. Mann’s method included a two-step procedure: (1) generate an image array by a process affecting all pixels equally, without regard to its surroundings, (2) convert this image array, using local processing areas (remapping tones, etc.) in an HDR image.

1997
In 1997 this technique of combining several differently exposed images to produce a single HDR image was popularized by Paul Debevec.

2005
The Photoshop CS2 introduced to HDR merge function.
After learning a little history of this technique we show its performance. The first thing to do is to know when to use it. This process is necessary when the lighting situation presents a contrast too high so that we record a single image, and lose pieces of information from it.

Place the tripod to take pictures that are accurate and a change in exposure between them. It is advisable to use the timer to ensure the minimum camera shake when shooting.

The approach place it in manual to avoid moving from one image to another.

We must choose the exhibits to use, so that between them we get to capture all the information it presents Scene

- Picture 1: correct exposure as possible
- Image 2: exposure to dark tones
- Image 3: Exposure to light tones
We will take these three RAW files and process with the specific software such as Photomatix Pro:

Resultado final:

In the result we can see how we have solved this situation typical extreme contrast within a closed forest. All information has image without lose any industry sector. It also highlights the colors to keep the image is too flat.
3.1.3 Panoramic Photography. Description of method used in this TFG

A panoramic image is showing a picture (from the Greek pan, all, and horama view). This generally means that the image is at least two times wider than high, since it is the best way to display large viewing angles. Panorama shooting is a widely used format photography in urban spaces. The term also applies to pictures cut with elongated appearance.

1843
A camera was developed by Joseph Daguerreotype Punchberger It set out a longer than usual, with more than 24 inches (610mm) long, allowing panoramic imaging.

1888
With flexible films, was evolving panoramic photography. Dozens of cameras were marketed as the Cylindrograph, Panoramic Gonder, Pantascopic or Cyclo-Pan.

Currently panoramic photographs are created digitally. Are achieved by joining successive individual pictures that are assembled by means of computer programs, and the method of fusion may be rectilinear or spherical.

After learning a little history of this technique we show its performance.

This technique is applicable in situations in which the visual field that we want to capture is too large to display in one image only. So joining multiple images get the desired visual field. But when it comes to taking pictures keep in mind certain considerations.

The use of panoramic tripod and a ball joint that allows us to find the nodal point and parallax deviations that occur between objects at different distances when the camera is rotated. The patella pan and level must be balanced horizontally and the camera should rotate on two axes (vertical and horizontal) that pass through the anterior nodal point of the lens in use.
When we take pictures we must ensure that shoot in manual because if not exhibitions will be different and will change in the connections between the images when we do the picture. Also set the focus to manual so that the depth of field is the same in all the pictures that make up the panorama.

Another aspect to consider is to leave plenty of room with regard to the important elements when you take the picture, since almost certainly going to have to cut a big part when acoplamos panning.

You can also combine this technique with HDR seen before.

The next step is to take pictures:

After we open with a specific program, in this case the PTGui software, and put them together.
After collecting the images with the program get a picture with the perspective we want to get.

To then edit and process in image processing software, such as Adobe PhotoShop
3.1.4 Panoramic Photography 360 degrees. Description of method used in this TFG

360 ° panoramic photography, dynamic, also called spherical panoramic photo 360 ° follow the same process as the previous creation but these are displayed interactively on-screen, moving the computer cursor over it.

Moving the scene, we can see the space from different angles. The production of both outdoor panoramic photographs (landscapes, tourist routes, hostels ...) and indoors (museums, theaters, exhibitions, sports facilities ...) are used for the network user can navigate these places and know them a little better. With these motion pictures get complete information of space we want to show.

The decision process is almost identical to the static panoramic, only changes that we must also take images of the sky or ceiling and floor, and we need to capture the entire space around us. We take several and make sure to include some elements which then serve as a reference for us when we gather images in the program will help place each one in place. Since it is likely that the program can not make mistakes to identify the location that corresponds to the image.

It is also advisable to use a lens angle as possible to cover the entire 360 space in the less possible shots.

images:
After we open with a specific program like PTGui, and put them together.

![Image](image_url)

3.17

After collecting the images to get this program:

![Image](image_url)

© Rafa Barbier 3.18

Finally after correcting possible errors in this file binding between images and process, we use the tool to convert to QTVR PTGui program from this picture get the. MOV To view and navigate panoramic 360° must open this file. MOV with video playback program such as QuickTime.
3.1.5 Time lapse. Description of method used in this TFG

The time-lapse photography is a photographic technique in which a scene is captured and lasts through many images spaced in time, and with them we developed a video or moving image in which reproduce that scene at the speed that we are interested.

This technique allows us to see phenomena that occur so slowly that they are invisible to the human eye, you can also capture the opposite process, something that happens very fast and recorded for playback at a slower rate. Useful for studies or estimates that are occurring phenomena, is also a widely used resource for recording documentaries and film projects, video, advertising and the like.

The time lapse technique requires good planning. Therefore it is important to choose locations and do a good study of light checking, the timing of sunrises and sunsets, in the case of outdoor scenes. A great tool for this is "The photographer's ephemeris" which allows us to predict the solar path. Another important issue to consider is the weather of the day.

Use of tripod is essential to anchor the camera and get exactly the same frame for each of the shots.

For the realization of a time lapse is advisable to have an intervalometer to avoid moving the camera when you press the shutter and the interval between shots is as accurate as possible. There are some cameras, which have a built-in internal intervalometer and to program a certain number of shots and a certain frequency.

We must also take into account a couple manual focus and exposure control exposure during shooting.

After this we have to calculate the duration of the time lapse, and that period of time you want to capture. Another key factor is the interval between shots, which will mark the speed of our final video.

The longer the interval between shots, the faster you move items in our reproduction of the scene, because over longer between each image, movement, or action will occupy fewer frames, therefore less time in our final video.

But we must also take into account the actual speed at which they move these items into the scene, and we need to adapt to it by the interval between shots. Not the same car on a highway shooting that clouds in the sky.
As an example, some suggestions that I have considered in this TFG:

- Clouds moving very slowly, one frame every 20 seconds.
- Clouds moving fast: one frame every 10 seconds.
- Clouds moving very fast: one frame every 5 seconds.
- People walking down the street: a frame every 2 seconds.
- Path of sun a cloudless day: a frame every 30 seconds.
- Landscapes night, stars, moon, etc.: one frame every 35 seconds with 30 second exposure, ie 5 seconds between shots.

After knowing these suggestions and the proposed method, we simulate the organization of a time lapse:

- Video length: 15 seconds
- Frames per second: 25 fps
- Calculation of number of images 15sec x 25img = 375 images
- Number of photos: 375 images

The next step is to choose the shooting interval:

- Path of sun a cloudless day: a frame every 30 seconds.

With this information we calculate the time that we will be taking pictures:

1 minutes - 2 images
X min - 375 images

3h 7 minutes is the time we will take all pictures.

With this information you have to plan that amount of time we want to capture, and depend very much on the light of the moment.
As mentioned before there is a program called "The photographer's ephemeris" which allows us to understand and control the solar paths to detail.
In this case, images were taken following the instructions discussed above.

To then edit in digital processing software images. Finally the assembly was held in the GFR, using Adobe After Effects.

As the result can be displayed in paper format in the annexes may find links from sample.

3.2 Locations
Another important aspect was the choice of the spaces to be entered into the project. There was only one that was included insurance, and is the building itself CITM in Terrassa, which would conduct the field tests with the selected tools.

The next step was to select the building on which to perform the final study, and developed a list of potential places to document.

- Theatre of Lleida Llotja
- Headquarters of Gas Natural in Barcelona
- Media-ICT Building - 22 @ Barcelona
- Vic Theatre L'Atlàntida
- Hotel W. Barcelona
- City of Justice of Barcelona and Hospitalet de Llobregat
- Can Framis Museum, Barcelona
- Torre Agbar, Barcelona

It was finally decided by the Teatre Vic L'Atlàntida one hand was a very attractive building to photograph, and a grateful environment and easier to handle than in other cases.

On the other hand the possibility to easily obtain permits so that it can shoot as many times as necessary. However in other cases access was going to be much more problematic.
3.2.1 Viewpoints

The first step was to study the building through applications such as Google maps or Earth, which allowed us to choose the necessary views from an aerial image.

With this application we can see where it can be interesting to avoid visual obstructions placed or uninteresting viewpoints.

Once we have an idea conceived, the best option was to travel to places and check in situ study from home. We rode the space and a data pad pointing were going we would be of a great help later.

It also may help some reference picture of where we take our first visit that will support to notes taken in our notebook

We will conduct this process with all the techniques we have selected, (photo, HDR, Panoramic, 360 ° ....) taking into account the particularities of each, we will choose different views depending on what interests us grasp.

It is important to properly perform this selection of points of view, otherwise the previous study of solar paths will not be as accurate because not knowing exactly the point of view we will not know that lighting conditions would be appropriate.
3.2.2 Lighting

Lighting is a key issue, and therefore have to be very careful with the choice of lighting situations we are most in each application. It depends on the characteristics of the subject and what you want it to highlight what we will choose the right light parka each case.

Once chosen the views, we will study the solar paths to decide the date and time with the lighting of the most appropriate architectural scene.

Software, such as "The photographer's ephemeris", we make this easy. This program allows us to fully know solar paths, which means that we can find the light that will make a specific day at a specific time also, at any point that interests us. This information allows us to plan our sessions perfectly location to make the results we seek. Although we have to take into account the meteorological situation present, because all these calculations will be useless in adverse weather conditions.
The program works as follows, choose the location, day and time of the decision where we want to take the picture. This program tells us, among other things, rising and setting sun, the sun's position on an aerial image from Google Maps and Azimuth and Elevation angles solar on a specific date and time. This allows us to predict the direction of the light for each chosen point of view.

Also note that for the time-lapse is a bit more complicated, since we must take into account more elements, such as the time that we will be taking pictures and how lighting changes the meantime. We must use this as a resource for choosing the path of the sun that most interested us descriptive and aesthetic level.
3.3 Materials

Items that are been required for project development:

- Nikon D700
- Nikkor 24-70 mm f/2.8 G ED AF-S
- Samyang 14 mm f/2.8 IF ED UMC
- Tripod Manfrotto 190 XPROB
- Swivel 3D Manfrotto
- Ball joint Novoflex panoramic VR-PRO II
- Level
- HOYA 77mm Circular Polarizing Filter
- Hama Cable Release
- Acer Aspire AX3950 PC
- Display Eizo ColorEdge CE210W
3.4 Software

Software elements that are been required for project development:

- Adobe PhotoShop CS6
- Adobe Bridge CS6
- Adobe AfterEffects CS6
- Adobe Media Encoder CS6
- Adobe Camera Raw 7.4
- PTGui Pro v.8.0.2
- Photomatix Pro 3
- The Photographer’s Ephemeris
- GBDeflicker
- Google Earth
- Microsoft Office 2003
3.5 Field Tests

This project has been very important field tests have been carried out before starting the project itself, and complex techniques are used, which do not have experience. The part of the field tests were performed in the CITM. We chose this location for the facility to work there, access any necessary spaces to use the equipment and technical resources available to the center. Doing these tests in the CITM allowed images and processes repeat as many times as necessary and provided, also, the supervision of the project manager in making same images.

Field tests were conducted with each selected technique.

Here is a sample of field trials in the CITM, where you can see traditional photography techniques, HDR / LDR and panoramic.

As the time lapse and 360 ° panoramic views can not be shown here viewing links attached to the annexes.
As a comment on the field tests, we can say that there were problems only with the realization processes of 360° spherical panoramas and time lapse.

In the first case there were different problems to easily attach some pictures, by the lack of reference points in different images to have the CITM spaces with smooth walls and monochromatic.

To solve this problem we used a PTGui Pro software tool, called check points, and that is to indicate on each picture to choose and where points are found in the following image, manually solving most problems of this type.

Here is a screenshot of the tool monitoring points:

![Screenshot of PTGui Pro tool monitoring points](image)

The other problem was that the images to be taken of floor and ceiling or sky, often does not contain a reference to the rest of the pictures taken couple build the panorama. The program then is unable to join them because it lacks binding sites. If no image benchmarks points Control tool will not help us, because we have no choice points.

The only solution is to take pictures, but this time make sure that the photographs that make up the ceiling and floor contain some benchmarks that can later be assigned to the control points to collect everything correctly.

In the time lapse were also some problems, despite the initial study many mistakes were made which later had to be corrected.

The first was ended, because in a time lapse in which only wanted him to move sunlight and shadows, a tree was introduced in the first plane of the composition that moved with the wind and all the attention diverted the main element. Being situated this scene in a small courtyard, are believed a priori that the movements would be null tree.
Another problem was the flashing that was produced between the different takes. The first thing we did was set everything to manual, and as not entirely solved started looking for other reasons.

One solution was to use a manual lens, that does not have electronic diaphragms, or unscrew a bit in order to lose electronic contact with the camera, so the diaphragm will always remain in the same position. (This solution we seemed appropriate since it could jeopardize the goal)

In the end they solved most of these problems with the software flashing GBDeflicker

Another problem was moody lighting. In short time was no problem, but in long takes 2 or three hours if it was, since the direction of light and the contrast of the scene changes much.

He had thought to make a time lapse of the last hours of daylight and early evening, and did not know what was the best option. For one could not put automatic exposure in any way as the flashing between shots would be very obvious, on the other hand if you put in manual exposure as dusk started at that time also light very fast exchange, being very dark the latest pictures

The solution adopted was manually changing exposure as you change the lighting. It was not a comfortable or easy solution, but it was the one that was considered more appropriate.
4 PRODUCTION

4.1 Organisation and Logistics

The organization of the production of the project has as main objective the optimization of time I had, which was limited by the permissions obtained for photographs. Also had to travel to Vic foresee is the location where space is chosen, which meant driving more than 1 hour away.

The first thing we did was contact and make an appointment with the director of the theater, Lluis Vila D'Adabal. Once assembled you will explain the reason for the visit and was shown the field tests were conducted in the CITM.

We contacted the head of the theater room, Sara Lladó to coordinate photo to make. The treatment has facilitated the development of this project.

There were 5 variables that had to control for, conducting pictures: The lighting was needed, the weather, the presence of public or not in the theater, the availability of theater people and my staff.

Was achieved successfully organize and facilitated execution photo shoots

I have used three tools that have helped me to organize of work, which are:

- Google Calendar
- Google Drive
- Dropbox

With these tools provided me check all dates and reminders documents relating to the project. What is very important when you have to organize these sessions and depend on other people.

To carry all the necessary equipment has not been a problem, since the theater is located in an area with easy access and parking. Also in the theater, I have provided you keep the possibility of material not used in a safe place.
4.2 Sessions on location

The location sessions are divided into 4 types, and each with its own characteristics:

- **Outdoor Photography Sessions**: These sessions include standard photo taking, photography HDR / LDR, panoramic and 360 degree spherical panoramas. It was easier to organize and run as it is not needed to contact anyone of the theater and it was possible to move freely around the outside. He just had to take into account the lighting and weather, besides taking care of my days and hours that was not very busy.

- **Interior photography sessions**: Includes standard photo taking, photography HDR, panoramic and 360° spherical panoramas interior spaces and private theater. Such sessions have the peculiarity that the theater was developed within the necessary contact and permission of the management of the center. For the rest were similar to the previous with the difference clear that natural lighting and weather were secondary elements in the shots of the photographs.

- **Photoshoot for creating time lapse in outdoor architectural spaces**: These types of images were the most difficult to manage. We have already discussed that could optimize the work in preproduction, checking in advance the views and solar paths required. The forecast in preproduction photography has avoided many problems in the production of the photographs. But still there was the fact the 2 or 3 hour session with the camera fixed in one spot. During this period of time the only job was to change the exposure if necessary, since the time control shots are done with the help of the camera's timer. The main drawback is that you had to carry everything you need when you start, because as we mentioned note can move and you could not move for a long period of time. They had to avoid the risk not to move the camera in full working session.

- **Photoshoot for creating time lapse in interior architectural spaces**: Unlike the previous one, these work sessions were easier to manage. The main reason is that they were photo sessions shorter time for the content of the images, with the predominance of artificial light and the continuous changes of natural light. What was sought in these time lapse was to show the movement of people, and people move fast so usually session 30 minutes and could get videos of 20 seconds. The main drawback was sense and control the movements of people in photographic scenes. In this sense there's help center managers to choose most appropriate day for this type of photo shoots.
4.3 Problems presented

We will list the main problems that have arisen when developing the project:

- Availability of the rooms of the theater
- Choice of theater performances
- Time lapse - Blink
- Time lapse - exhibition
- Time lapse : moving elements
- Time lapse : camera movement
- Time lapse Sessions outside very long and heavy.
- Time lapse Sessions inside conditioned by the organization of the proceedings.
- Panoramic 360 º junctions
- Panoramic 360 º : no reference in floors and ceilings
- Overview straight : reduce or cylindrical field
- Low quality Objective : manual correction
- Specularity of materials and reflections : poralizador filter usage.
- Weather.
- Additional costs: travel , subsistence , .....
5 POST - PRODUCTION

5.1.1 Material Selection

The post-production process begins in selecting, editing and analyzing images taken. First, select which part of the material will form part of the project finally and some not.

The main tool I used for the selection is the Adobe Bridge CS6. This application allows sorting by numbers or colors the images that interest us and then filter them from the others. Also can be tagged with keywords and metadata meet.

Another option that is very good this application is choosing what information is displayed below the file name, size, dimensions, etc...

Thanks to this program and its options have been easier I select material that would be used in post-production.

The selection should be the appropriate sense of the best description of space possible, which is sometimes not compatible with choosing aesthetic results, so on more than one occasion he had to sacrifice aesthetics in favor of the project objective.

The selection depended on the types of sessions performed, while the more complicated techniques like time lapse or 360° panoramic selection has been easy because production has not been very high for the rest of the techniques used in production has been very great because unlike the techniques mentioned above are very simple to use, and before long we can take a big production.

Once the selection is passed to the processing of the material, which for each technique used will be different, with its own programs and tools according to the features present.
5.1.2 Standard Photography. Processing and correction.

Steps taken for the digital processing of images:

- Open the files in Camera Raw

- Modify the color temperature and exposure to make the image with the maximum amount of information.

- Correction of lens to correct chromatic aberrations if any, and distortion. Also if you need vertical or horizontal.

- Cut out and keep it as 16-bit Tiff

- Open the files in PhotoShop

- Apply an action set contains many layers of all types, levels, curves, saturation, color balance, etc. ...

- We modify the layers to have an exposure control and contrast areas

- Apply a noise reduction filter if necessary

- Apply a filter Mexican Hat to improve the visibility of the edges.

- Save as 8-bit Tiff
5.1.3 Photography HDR / LDR. Processing and correction.

Steps for processing and image correction:

- Open Raw files in Photomatix Pro

- Apply the HDR process - Tone Mapping for LDR image with all the information of the different exhibitions.

- Cut out and keep it as 16-bit Tiff

- Open the resulting file in Photoshop.

- Correction of lens to correct chromatic aberrations if any, and distortion. Also if you need vertical or horizontal.

- Apply an action set contains many layers of all types, levels, curves, saturation, color balance, etc. ...

- We modify the layers to have an exposure control and contrast areas

- Apply a noise reduction filter if necessary

- Apply a filter Mexican Hat to improve the visibility of the edges.

- Save as 8-bit Tiff
5.1.4 Panoramic Photography. Processing and correction.

Steps for processing and image correction:

- Open the files in Camera Raw

- Modify the color temperature and exposure to make the image with the maximum amount of information.

- Correction of lens to correct chromatic aberrations if any, and distortion. Also if you need vertical or horizontal.

- We cut and store them as 16-bit Tiff. The whole process should be identical for all images that make up the panorama.

- Open the files in the software PTGui Pro

- We panoramic composition collecting files.

- Open the resulting file in Photoshop.

- Fix possible failures in the joints and clean the image.

- Apply an action set contains many layers of all types, levels, curves, saturation, color balance, etc. ...

- We modify the layers to have an exposure control and contrast areas

- Apply a noise reduction filter if necessary

- Apply a filter Mexican Hat to improve the visibility of the edges.

- Save as 8-bit Tiff
5.6

5.7
In developing the project, I noticed a phenomenon that I describe below:

Rectilinear Panorama or Equirectangular:

The first set of images are two panoramic photographs, created from the same images but in different ways. As can be seen, one deforms the lines, while the other does not, but at the same time lets see a much larger field of view. In this case it seems too by the distance to the objects and the chosen viewpoint.
But in the second group of images can be clearly seen that the second bends shown in the first space, but also see as deforming just horizontal lines, while the first all the lines are correctly represented.
5.1.5 Panoramic Photography 360 degrees. Processing and correction.

Steps for processing and image correction:

- Open the files in Camera Raw

- Modify the color temperature and exposure to make the image with the maximum amount of information.

- Correction of lens to correct chromatic aberrations if any, and distortion. Also if you need vertical or horizontal.

- We cut and store them as 16-bit Tiff. The whole process should be identical for all images that make up the panorama.

- Open the files in the software PTGui Pro

- We panoramic composition collecting files.

- Open the resulting file in Photoshop.

- Fix possible failures in the joints and clean the image.

- Apply an action set contains many layers of all types, levels, curves, saturation, color balance, etc. ...

- We modify the layers to have an exposure control and contrast areas

- Apply a noise reduction filter if necessary

- Apply a filter Mexican Hat to improve the visibility of the edges.

- Save as 8-bit Tiff

- Open the file again with PTGui Pro, and proceed to turn that into a flat image. Flash or. Mov which includes the panoramic 360 °
5.1.6 Time lapse. Processing and correction.

Steps for processing and image correction:

- Open the files in Camera Raw
- Modify the color temperature and exposure to make the image with the maximum amount of information.
- Correction of lens to correct chromatic aberrations if any, and distortion. Also if you need vertical or horizontal.
- Cut out and keep it as 16-bit Tiff
- Open the files in Adobe After Effects and created the time lapse choosing the parameters that interest us.
- Open the file in GBDeflicker to fix video flickering errors.
- Finally we use Adobe Media Encoder to convert video to a smaller final format. H264.
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6 CONCLUSIONS

Now that the project has come to an end, we can look back and make an assessment of what has been this project in their months, as our conclusions regarding this TFG. You could say that the project has been completed successfully, either for the content of images as by the structure of the photographic image made. The project has been a long process, but eventually, after many hours of work, we have been rewarded with the feeling of a job well resolved and over.

Once finished we analyze the results to see if the main objective is complicated. In my opinion yes it is, because we have obtained a working method which thanks to the different techniques used successfully get a lot of information on a space.

The set of the various processes worked simultaneously gives us a very broad and allows us to see different views of the same scene architecture, allowing us to better understand the space and the intention was the author of the photographs in the time of design and construction of the final images.

But within the different processes have also been problems, such as the technique of time lapse. It was not easy to get good results, the development of this process, the description of a scene graph architecture, and allow for a whole GFR.

This project has allowed us to see that these techniques are being used increasingly in various professional fields such as advertising, film, video, television and internet.

Once finished the project and reflecting on the work done and knowledge I have come to a conclusion. Lighting is fully determines the appreciation we have of a space. Therefore it is essential to work both techniques discussed before and the lighting for the best method of graphical representation of an architectural space.

I will be discussing the difference that occurs in a space depending on the lighting it receives. I have worked this look like in the series that show below, in which you can see the same point, but with an image taken at different times with different illuminations. Among the color of light, shadows and the sky could not be more different shots together conveying emotions different in each case. So I think it is the best possible tool expressive understand these resources and use them to our advantage, being able to choose for each situation and post the best way, the most appropriate version.
Example of different lighting to describe the same space:

Finally, we conclude that the project is completed as expected, and I am satisfied with the result. I met all the goals that I had raised.
7 REFERENCES


- Polidori, R. Metropolis. New York: Metropolis Books, 2004


Gabriele Basilico. Consultation March 2013: http://www.studiolacitta.it/LaCitta/Artisti/GabrieleBasilico.php

Candida Hofer. Consultation March 2013: http://candidahofer.xacobeo.es/


Consultation April 2013: http://www.creativephotography.org/slideshow/newtopographics/slideshow/index.html

Julius Shulman. Consultation April 2013: http://www.juliusschulmanfilm.com/


Marc Goodwin. Consultation May 2013: http://www.marc-goodwin.com/

Héctor Santos. Consultation May 2013: http://santos-diez.com/

Consultation May 2013: http://www.fotoarquitectura.com/

Consultation May 2013: http://www.fotografia-arquitectura.com/

Francisco Berreteaga. Consultation May 2013: http://www.berreteaga.com/
8 APPENDIX

Links of example to understand the panoramic 360°:

http://www.360cities.net/london-photo-es.html
http://www.ten360.com/de/laatzen/autohaus-polmaxx

Links to visualize Time lapse made:

https://www.dropbox.com/s/mjf2cpa3v34rs36/9.mp4
https://www.dropbox.com/s/abh5iprbz0f7s8/15.mp4