

Future of Photography: Next in Virtual Reality and User Experience

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Abstract

The “idea of an image” keeps changing in every few years as photographer and artist become more experimental. With the frequent developments in digital cameras, smartphones and other gadgets and tools, photography has become a necessity which earlier was merely a luxury. This paper aims to study the evolution of visual documentation from ancient art and paintings to digital photographs.

This paper also focuses to analyse this progression and find out the upcoming developments that might occur in this field in the near future. It will explore and identify the major shifts that can take place in the field with the introduction of Web 3.0, Meta-verse and other technological developments in gadgets and tools and what can be the possible challenges to acquire the same.

Keywords

Art, painting, photography, cameras, web 3.0, meta-verse, virtual reality, 3D photography, 360° photography.

Introduction

Art is practiced in many forms by human cultures and is regarded as one of the defining characteristics of human race. In every society, visual arts is intertwined intimately with music, painting, religious rituals, dance and literature. (Gillian M Morriss-Kay, 2010). According to Aristotle, human skills either imitates nature or completes what is incomplete in nature. Since prehistoric times, humans have progressively been inspired by nature in terms of art, architecture, habitation and much more. (Hans Blumenberg, 2000)

Humans, since the beginning of times has always found a need to collect information in forms of art and pictorial representations in order to be remembered in the coming times. From ancient wall paintings, to the first developed photography, to the latest cameras available today, the motive is constant i.e. to collect and record data. According to an article by Artincontext (November 19, 2021), when humans did not develop any kind of written language, various art forms served as a method for recording information between themselves and other tribes and generations during the stone age, Palaeolithic and neolithic periods.

According to an article by Rebecca young (2017), artist had began using a sort of primitive camera called “camera obscure” (meaning a “dark room” from which the word camera was derived) during renaissance in order to copy nature more accurately by the means of painting. The naturally occurring phenomenon, which was already been observed thousands of years ago, if a bright scene or an object is placed opposite to a hole cut on one side of a darkened space (a room or a container) the rays reflected off of that object passes through the hole converges into an inverted image which is projected on the opposite surface of the space. Camera obscure allowed only to view the image but not to develop in any manner. Using this very initial form of a “camera”, the artists starting initiating nature in a more accurate way by copying the projected image using paints.

Photography is greatly inspired from paintings and has followed a similar transformation to reach imitations of nature by applying similar light and shadow techniques which add expressions to the portrayed composition to recreate a true artwork within its evolution. With the process in photographic processes, photography has become an arm in creating mass produced realistic representations that can be served to a society in need of holding onto moments by imitations. Slowly photography replaced paintings and assisted world with instant photographic images. (Itziar Telletxea Rocha, 2015)

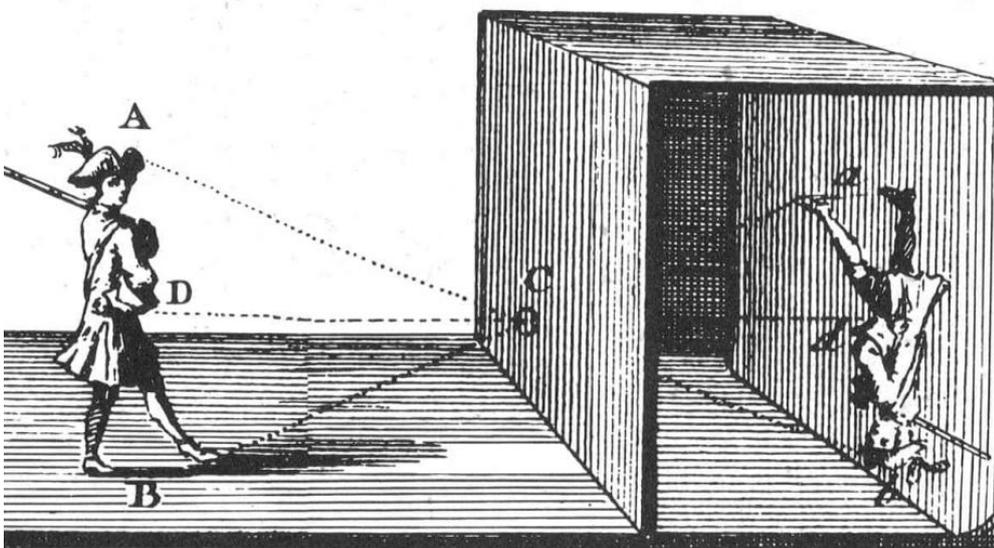
In this paper, we will establish how humans and their need to record data in the form of images, paintings and art gave birth to photography and how the introduction of photography gave art a new and imaginative direction. We will also breakdown this profession and transition from paintings to photography to imitate nature to predict future developments that might occur in the coming years in the process of imitating nature in relation with photography with the introduction of Meta-verse. Also, which aspects of photography might be replaced and how photography will inspire the birth of another form of imitation of nature.

Pictorial biography, is an individual representation of one's life comprising of pictures of various life phases. (Johannesson 1997, Anna Sparrman and Anne-Li Lindgren,2010).

1. The birth of photography

1.1 Early photographic experiment.

Before the camera became a necessity, it was a luxury. Artists were the main stakeholders of recording history through the means of paintings and other art forms. Around 1800 in England, Thomas Wedgwood managed to produce a black and white negative image inside a camera obscura on a paper treated with silver nitrate, a chemical which darkens when exposed to light. However the image was't permanent and in just few minutes the lighter part of the image turned dark when looked at in the light. This discovery of his was recorded in a scholarly journal in1802. (Rebecca Young , 2017)



An illustration of how a basic camera obscura works.

By Katherine Keener
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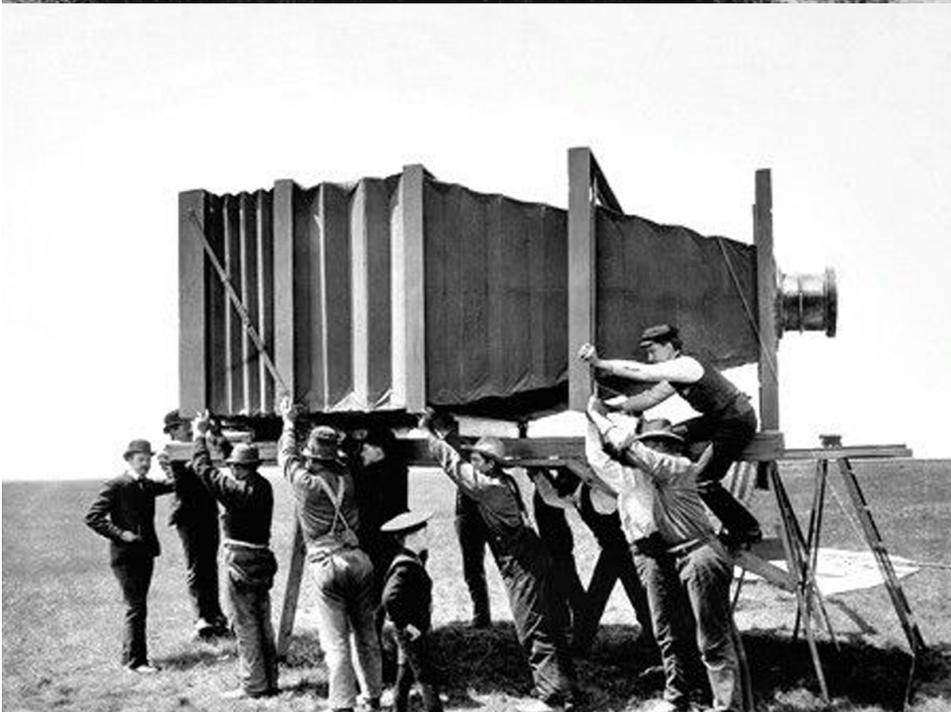
1.2 First Photograph

In 1816, Nicéphore Niépce a Frenchman was successful in capturing small camera images on paper treated with silver chloride, another chemical sensitive to light. Soon, he started experimenting with other light-sensitive substances and named the process as “heliography”, a greek work which means “sun drawing”. By 1826/7, he made another success in making earliest surviving camera photograph but the exposure time was of several days. (Richard E. Spear, Art Bulletin 1968, Douglas R. Nickel 2001)

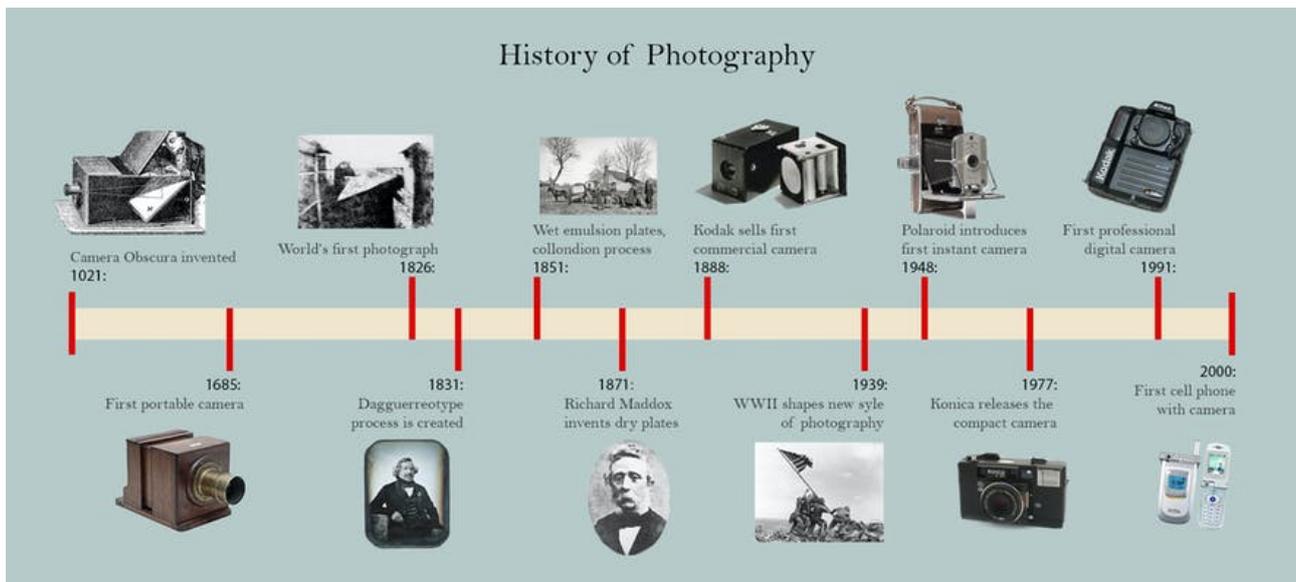


Joseph Nicéphore Niépce
View from the Window at Le Gras, c. 1826

Source: Harry Ransom,
Humanities Research Center
The University of Texas at
Austin



“The first camera ever
built. Taken with the
second camera ever built”



History of photography timeline. Photo by: 'Sean Ensck'.

2. The Rise of Photography

Photography is derived by a greek word where photo means "light" and graphs means "writing". Subsequently, photographer means the artist of light. The modern scientific understanding of light has evolved with the development of camera and photography making each picture unique form of art which has always been inseparable from science. Digital photography in itself was a result of the discovery of quantum physics by Albert Einstein. (Doble Rick 2013)

2.1 Photography for everyone

In 1878, George Eastman concentrated on making dry plates which would be much easier to work with than the previously used wet plate process that required immediate exposure and development. By 1889 his company, KODAK, successfully manufactured first flexible transparent roll film. By 1990, they massively produced

If it isn't an Eastman, it isn't a Kodak.

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EASTMAN KODAK CO., ROCHESTER, N. Y., *The Kodak City.*

brownie cameras, an everyman's camera. This was the beginning of a big change. Photography turned on the way towards becoming an activity that was available to general public rather than being just a specialised craft. The company promoted the word "snapshot" to market the message of quick and easy photography. (Doble Rick 2013)

2.2 Digital camera



Steven Sasson invented the world's first digital camera while working at Eastman Kodak in 1975. It weighed around 8 pounds (3.6kg) and shot a mere 0.01MP.

Unlike traditional film cameras that record a light image on film (analog), a still camera records images in digital form. Digital cameras save images on a flash memory card. There is a fixed maximum resolution and number of colors and pixels that can be represented. Images can be transferred to the computer via a USB cable, the memory card or wireless. Three major advances were made with the introduction of digital cameras over their earlier analog counterparts. First, the image could be viewed immediately and could also be erased. Second, any single picture could be printed without having to develop an entire roll of film. Finally, the memory card was reusable over and over.

Digital Camera Modes allowed photographers to control the exposure, specifically, Shutter Speed, Aperture and ISO. While certain modes could easily fully automate the camera exposure. (Nasim Mansarov ,2019)

2.3 The smartphone

A smartphone in today's date is probably the most convenient camera one can have. It fits in the pocket, and doesn't require any manual adjustments before taking a picture. Even if one owned a nicer camera, they probably would still use their smartphone to capture unexpected photo moments. (Nasim Mansarov ,2019)



Another major leap in that area was made almost 22 years ago. In May of 1999, Japan was the launchpad for the Kyocera VP-210

3. The Presence of Photography

3.1 Part of Life

Photography is so omnipresent in today's world whether in advertisement, science, current affairs, campaigns or may be just our own snaps as a form of memories. It is hard to imagine a world without a camera now and yet 200 years ago it never existed.

In a research conducted using several experiments to measure people's enjoyment who were encouraged to take pictures during a sight seeing enjoyed more against those told to leave their cameras in their pockets. In another experiment, where the two groups were asked to visit a museum exhibit where their eye movements were tracked, studies showed that the group instructed to take pictures were more

visually attentive to artefacts than the other group. The research concluded that taking a photo and enjoying the moment aren't two separate things. (Corinne Purtill, 2016)

Kristin Diehl, a associate professor of marketing at the University of Southern California and the study's lead author says, "Unlike checking your email or texting, where you are switching the experience and that task [to] potentially talk about something completely different (e.g. check your work email), photo-taking actually directs you towards the experience."

3.2 The truth

In 1858, when photography was introduced for the first time Delacroix, a French romantic artist mentioned that photography was to uncover the true design and that nothing less that "the truth" was at stake.

With the rise of photography, the need to follow idealism increased which gave birth to image manipulation. The art form which took birth to repent the "true image" and imitate the nature as it is could now be easily manipulated and create deception in the viewers mind.

Photo manipulation changed the perception of beauty since its inception. This practice is the most common n fashion magazines with made women feel more conscious about their physical appearance. As defined by Yourdictionary.com, photo manipulation were merely just techniques to alter photography to cause deception and create illusions. Photoshop is among the most used image-editing software to achieve it.(Kretz, 2011;Cuenca, Nigel Ivan R.Bill Christian Magtibay 2016)



Human's thirst to achieve "Idealism"

4. Future of photography

4.1 3D Photography

“3D photography is a form of photography that captures and displays two offset images that are a little different from each other, so much so that they produce 3D images”. In 1939, William Henry Fox Talbot invented the first set of 3D photographic stereo images by using his own photographic process. Although 3D photography is not much popular yet, there are plenty photographers willing to experiment with it because, as many have observed, the photos come out more vivid and detailed and is an effective way of making sure that images stand out. (Micheal Gabriel, 2020)



4.2 360° Photography

Unlike traditional flat images, VR images or 360° images are usually captured using a 360 camera consisting of multiple lenses that capture the entire 360 degrees of a scene. One such camera is the Samsung Gear 360 VR Camera, portable consumer VR device with 180° dual lenses that clicks images of resolution of up to 5472 ×



Samsung Gear 360 Real 360° High Resolution VR Camera

2736. The recent Insta 360 Titan is a professional 360 camera with eight 200° fisheye lenses that can capture both 2D and 3D images of resolution up to 11K.

After the images are captured, they are stitched together simultaneously by separate lenses to generate a spherical image. This image is then stored in equirectangular projection format. Therefore, unlike traditional viewing manner where people watch images and videos on flat surface or a screen, VR offers a more immersive viewing environment. The content that a user sees is highly dependent on the spatial distribution of image content, hence, only a small portion of the image is displayed as they gaze in any given direction. The free-viewing of high resolution, immersive VR implies significant data volume, which leads to challenges when storing, transmitting and rendering the images which can affect

the viewing quality. Therefore, it is important to be able to analyze and predict the perceptual quality of immersive VR image. (Meixu Chen, *Student Member, IEEE*, Yize Jin, Todd Goodall, Xiangxu Yu, and Alan C. Bovik, 2020)

Research Methodology

This paper is a qualitative textual analysis of various research paper and articles published on the related topics and areas. The references from these papers are then analysed to answer the questions that this paper raises. This paper does not prove or disprove the theories mentioned from the references, it only uses it as a pre-existing data available on the topic.

Analysis

Virtual reality (VR) is an emerging technology that creates life-like experiences in immersive virtual environments, using high-end headsets and gloves to allow the touch sense to function. Currently, most of the content that is consumed in VR is synthetic and needs to be created by professional artists and mainly, photographers.

Therefore one can imply that there is a large scope of profession in capturing 360° photographs in the coming future that will change the direction of photography in a large sense.

Casual 3D Photography system has achieves some improvement in reconstruction quality, but is still slow with a runtime of several hours per scene.

Virtual Reality requires much larger file sizes, different storage formats, and immersive viewing conditions. This possesses significant challenges towards the goals of acquiring, transmitting, compressing and displaying high quality VR content. The free-viewing of high quality, immersive VR requires significant data volume, which leads to challenges of storing, transmitting and rendering the images which can affect the viewing quality. Therefore, it is important to be able to analyse and predict the perceptual quality of immersive VR image.

With the introduction of VR photography, more higher supportive softwares will be required to edit and recreate images, which also means that better computers will be required to do so as well. With the introduction of Web 3.0, meta verse and 5G internet, humans are coming closer to imitate nature in a much more realistic, interactive and advanced manner.

Conclusion

By gathering the above data, one can determine that photography is not just going to be an image on a flat screen of a piece of paper in the very near future. The technological experiments are already been worked on and tested to introduce a 3D feel to photographs.

In the race to imitate the nature, photography is yet going to be more realistic and interactive in next few years. Although just like the last time, when photograph was only available to those who were equipped and trained to understand the mechanism of how a picture is developed, the 360° and 3D photography might also be available based on affordability of the technology as most photographers and common people are now willing to experiment with the functionality of photography at a newer level.

Web 3.0, VR and 5G internet has brought us one step closer to imitating nature in a 3 dimensional form. This newer technology might first be available to those who are equipped and trained to understand the functionality of 3D or 360° photography. Also, it will be highly affected by affordability and technological factors.

Limitations

This study does not establish the technology and digital advancements needed to determine how the upcoming process in photography will take place. This study is merely to analyse the possible changes in photography as the world is progressing each day.

This study should also not be referred as a complete source of information about the history of photography. It only mentions and analyses major advancements and not a detailed evolution of photography.

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