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Digital Art is the convergence of technologies A review

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ABSTRACT: With the rapid growth of digital technology, digital art is getting refined and refined. Digital mediums are in a continuous state of flux.More and more artists are accepting the digital art as art since it involves creativity and the knowledge of 'art and design' principles. Still a question mark is there and it has been become an argument that "Digital art is not real art since it is machine generated and infinite number of copies can be generated with no 'original'. This paper of mine is an attempt to justify the quote "Digital Art is the revolution in art" without disquieting the grace of traditional art. I don't think either is killing the other one. The paper includes the reference of various technologies that make the digital art rich.Technology has opened up new potential for dissemination and public engagement with artwork. (Digital images/paintings). This paper has been written, keeping in mind the paintings, drawings and images as digital art.

Keywords
Digital art, traditional art, digital technologies

Introduction

Digital world is not static. It is changing very rapidly. The technical development and advances in hardware(PCs, mobile phones, tablets, ipads/ipods), Software(System S/W and Application S/W) that includes GUI supported operating systems, search softwares, social network sites, graphics softwares etc., storage (CDs,DVDs, optical storage,flash storage) and networks(internet and mobile telephone) have added a new spirit to the art work.

Traditional art can be thought of a product of human creative skill and imagination, in a visual form such as painting or sculpture, that influences and affects one or more of the senses, emotions, and intellect. Generally, art is made with the intention of stimulating thoughts and emotions.When we talk of digital, we mean the numeric data and computer is a digital machine. So, the art created on the computer is called digital art. The drawings, paintings and 3D characters created using the graphic tools on computer are the examples of digital art.

Traditional and Digital Art

When the question arises- which one is the true art? I believe that both are the two categories of visual art that have their own unique qualities and can exist in harmony under the visual art. Digital opens new doorways and sometimes results very creative outcomes that are difficult to achieve with traditional art. On the other hand, traditional media allows outcomes that are hard to replicate digitally.Traditional art seem to give more satisfaction and is less challenging due to the lack of learning the software tools and working on computer. For the artists who are creative, digital is another medium and for them, medium doesn't matter.

Digital technology – a stimulant for art

- Digital is referred to data represented by numbers and art is made with the intention of stimulating thoughts and emotions.These two concepts "digital" and "art" are quite distant and are jointly used with very open meanings now-a-days.
- Digital technology has transformed the human expressions as the art piece. This may be a painting, drawing, sculpture, music and even poetry. The software tools help the artists to enhance their creative skills towards innovative and unexplored paths. Technology, creativity and knowledge give birth to new forms such as net art, digital installation art and virtual reality.
- As the technology expands, the possibilities of art expands.There are so many ways to combine the traditional and digital art.For example a traditional drawing is scanned and stored in a computer as the digital document. Using image editing tools,the modifications can be done in this document. Parameters like color, shading, texture etc can be added.
- Technology helps to see the connections between mathematical ideas and art. The Digital Art combines together the Art, Math, Science and Technology.The Digital art need the knowledge of art, computers, design and the innovative spirit.
- Technology has the ability to allow the people to create amazing and beautiful pieces with the aid of technological resources.

- Technology can be accepted as the medium to creatively communicate information, beauty and emotions through art.

Technologies used in digital art

Few of the technologies are inherent in the very nature of digital art.These allow the information and processes to be created in the form of digital art and are stored in the digital storage with the possibility of distribution over electronic networks.

Electronic

Digital art is all electronic art in the sense that all digital art is created on computers. Computers are the electronic machines that work on binary digits.All the material required to generate the artwork(Painting/drawing) is in electronic rather than physical form. Even the artwork itself is in the electronic form ie. in some image file format and is stored in the electronic(machine) storage. From the process of preparation for the creation of the art to the delivery stage, all mediums are electronic objects(Hardware/Software). An artwork may be created by recording events in the physical world, by manipulating or remixing electronic information or by combining these processes. In a computer art, it becomes difficult to differentiate between what is recorded and what is fabricated.A digital copy of the digital artwork is very close to the quality of the traditional original art.

For the creation of a high quality digital art:

- the platforms(laptop, personal computer, workstation, mobiles, tablets etc.)
- I/O devices
- system software(windows, linux, device drivers)
- software tools(Photoshop, Adobe illustrator, MS Paint, etc.)
- built-in clip art libraries
- graphic cards
- high resolution graphic monitors
- large amount of secondary storage (optical/flash memory)
- High speed processor
- Adapters
- Scanner
- High quality color printers etc used are all electronic.

I/O

A touch screen is an intuitive computer interface that functions as both an input and an output device. Rather than using the keyboard keys or pointing with a mouse, touch screen allows the users to navigate a computer system by touching icons or links on the screen either by a finger or **with a stylus. Using the touch screens and tablets, the artist can create art similar to the artwork** created in a **well-stocked art studio.** A touch screen system comprises the three basic components- a touch screen sensor panel which generates the required voltages according to the location, a touch screen controller that processes the signals received from the sensor and translate into the touch event data which is passed to the computer's processor and a S/W driver that provides the interface to the operating system.

Resistive touch screens respond to the finger pressure or stylus pressure.

Capacitive type touch screens require contact with a bare finger or conductive stylus. The availability of the capacitive paintbrushes provides the feeling of using a traditional paintbrush when creating art on a touchscreen device. The bristle fibers of the paintbrushes are very fine and aren't individually recognized by the device but when combined in the bristle tip, its advanced hair technology and construction creates a spring and responsiveness that gives a feel of real painting. The whole thing conducts electricity.

In modern era**, tablets** are the tools of choice by digital painters. Tablets can range in size from 4" x 6" to 12" x 19". Artists prefer the tablets having specific features for graphic applications like high pressure sensitivity, good pen accuracy, HD ultra sharp high resolution screen, high aspect ratio, millions of colors, full versions of programs such as Photoshop and Multitouch facility (meaning the ability to use your hands) to create a fine digital artwork.

Inkjet printers include processes that use fade-resistant, archival inks (pigment-based), and archival substrates primarily produced onCanon, Epson, HP and other large-format printers. These printers use the CMYK color process.These printers may use the multiple cartridges for variations of each color based on the CcMmYK color model. It results the increases in the resolution and color gamut and allows smoother gradient transitions. The look of the digital art also depends upon the type of printing paper used. Eg. a glossy sheet, heavily textured matte paper or canvas stock provide their own look and feel to an image.

Storage technologies

Digitally stored artwork occupies little space as compared to physical artwork. If appropriate storage and playback facilities are maintained, artwork can be kept and accessed for very long periods of time.

The digital art is quite demanding in terms of processor speed and storage capacity.Traditionally, data storage for computers has mainly been based on magnetic

storage technology like magnetic tapes, floppy disks and hard disks.

In 1990s, the optical technologies became popular, allowing random access to voluminous amount of data, inexpensive duplication, long media life, high data integrity and capable to store multiple media. Data on the optical storage is read by laser light.There have been various types of optical data storage disks that vary in types of laser which determine the size and packing density of the pits and lands. The wavelength of lasers is Red 780-622nm, Orange 622-597nm, Yellow 597-577nm, Gree 577-492nm, Blue 492-455nm, Violet 455-390nm. HD DVD uses Blue-Violet laser of 405 nm.Their maximum capacity is limited to few tens of gigabytes.

The current methods of storage of digital art and digital paintings archiving rely primarily on magnetization-based storage technologies like HDDs. To store the large amount of data, data centers composed of arrays of thousand of HDDs have been built. The capacity of HDD units is sometimes not sufficient when data is too much because it is less than 1 TB(1000 GB).

Big data centers with petabyte (PB) and sometimes Exabyte (EB) capacities have been emerged. The technical storage solution for the next generation of big data is cloud computing. The current trend is storing the data remotely and accessing via networks.

For the digital artwork, as it takes a big storage, it is required to compress and store using the compressed file format. Another advantage of compressing the digital art is less time consumption when required to transfer over the net.

Networking

All the digital art is electronic in nature. It can be moved over worldwide electronic networks(Internet/mobile networks). Once artwork is on the net, it can be made available in different file formats. On the network, the various types of art data can interact with each other.Due to this technology, the artists from different locations can share the space for creating the artwork. Even a team of artists can work on the same artwork.

Interconnection

If the digital art is open to modifications, a number of artists can access the art from different locations simultaneously or at different times. The public can also interact with the artwork through the online art communities. They can comment,critique recommend or buy the artwork. Artists can also use the social media as a powerful tool to change the relationship between collectors and the public by spotting people/organizations looking for specific type of art.Artists can also take advantage of new services like crowdfunding via network to raise money online to persue their ideas.

Protection

When the art is on the net, the chances of theft, plagiarism and misuse are always there. To protect the artwork from these, the file size can be reduced and the quality of the art can be optimized properly.

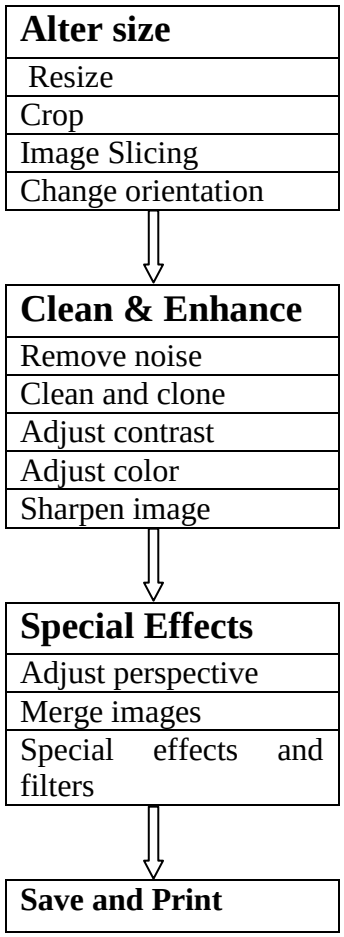
A digital art can also be embedded with a watermark to protect it from plagiarism. A watermark is a visible embedded overlay on a digital photo consisting of text, a logo or a copyright notice. The purpose of it is to identify the work and discourage the unauthorized use. Watermark should be a copyright symbol along with the name of the owner, and the URL of the owner's site.

Software tools for Digital Art

Software tools are nothing more than shortcuts to making art with out learning the fundamentals. Digital Artists argue that it is not a shortcut but another tool for making art, like a new kind of brush or paint. Digital tools are the source of creativity with endless potential for artists. Traditional painting techniques such as watercolor, oils, impasto, etc. are applied using digital tools by means of a computer, a digitizing tablet and stylus, and software (such as Photoshop and Corel Painter). Adobe Illustrator, Photoshop, MS Paint, Corel Painter, Adobe Photoshop, Macromedia f reehand, 3D Studio, ArtRage, GIMP , Krita, MyBrushes and openCanvas etc are few very popular tools which are being used by the artists to create the artwork from the scratch. These graphic softwares provide a rich digital environment: a canvas, painting tools, mixing palettes, a virtual palette consisting of millions of colors and the ability to take back mistakes, as well as erasers, pencils, spray cans, brushes, combs, and a variety of 2D and 3D effect tools.

Adobe Photoshop provides several tools for painting and editing image color. The Brush tool and the Pencil tool work like a traditional drawing tool applying color with brush strokes. Tools like the Eraser tool, Blur tool, and Smudge tool modify the existing colors in the image. The artist can set how color is applied to an image and choose from preset brush tips.Once the image is complete, the artist uses the image editing tools.

The sophisticated editing programs have layering capabilities. Layering is a common technique of isolating various elements of an artwork.



Conclusion

While digital painting allows the artist the ease of working in an organized, mess-free environment, some argue there will always be more control for an artist holding a physical brush in their hand. Some artists believe there is something missing from digital painting, such as the character that is unique to every physically made artwork.The hardware and software technologies fill the colour to the digital art. These make the art rich. Moreover, both the traditional and digital art should be treated as the two separate types of art using the different mediums. It is the artist's choice, which medium is to be used. Both traditional and digital art need creativity. Due to digital technologies, art can now be considered as data that can be stored in an electronic form, modified on the machine and shared on the net.

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