DIGITAL IMAGING

Preparation of Digital Images using Media technologies

Diploma in Multimedia and Animation (DMA)
Digital Imaging

Block – IV: Preparation of Digital Images using Media technologies
Introduction to Multimedia

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**Concept / Advisor**

Dr. Srikant Mohapatra  
Vice- Chancellor  
Odisha State Open University, Sambalpur

**Course Writer**

Ramyaranjan Tripathy  
Senior Graphic Artist, Kalinga Television, Bhubaneswar

**Course Editor**

Dr. Ajay Yadav  
State University of performing & Visual Arts, Rohtak

**Video Production**

R. Mohana Sundaram  
Creative Director  
Jai Ram Institute of Visual Academy, Khurda, Odisha  
Guest Faculty, National Institute of Fashion Technology (NIFT), Bhubaneswar

Sanjay Kumar Sahoo  
Manager, Corporate Communication, JSW Steel Ltd.

Dharitri Priyadarshini (Researcher at IMRB International)

Biranchi Prasad Sahu (Freelance Graphic Designer)

**Published by:**

Dr. Jayanta Kar Sharma  
Registrar on behalf of Odisha State Open University, Sambalpur

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Course Overview

Welcome to Preparation of Digital images using media technologies

In this block, you are going to study about the software and tools and techniques used in the software to create a Graphic Design. The design works which used to be done manually in the old era, using pencil, paint and brush, are being replaced by modern computers on which we can draw or make anything with the help of different softwares. Now the computer hard disk works as the canvas and softwares work as various types of paints, pencil or charcoal.

You will learn about different kinds of professional project works which are done in the industry using these softwares.

Working with digital images

In order to work with the digital images we must be clear with some basic features as about the fundamental unit of a digital image that is pixels, and arrangement of these pixels are done into arrays and now further these arrays are organized into single or multiple layers. In this course, we shall know about the pixels, arrays, and layers to have an understanding together how they make a digital image.

Managing file formats for images

Whatever image or picture we share or get is present in the form of a file, and file shave a huge range or variations of different formats. Some of the file formats that compress the image also reduces its quality and degrades it. But some time choosing a wrong file format may increase the size of file the significantly that is not required.
Image Editing with GIMP

Gimp is a freely distributed piece of software suitable for such tasks as photo retouching, image composition and image authoring. It is an extremely capable piece of software with many capabilities. It can be used as a simple paint program, an expert quality photo retouching program, an online batch processing system, a mass production image renderer, an image format converter and more.

Technique behind Visual effects

Visual effects involve the integration of live-action footage and generated imagery to create environments which look realistic, but would be dangerous, expensive, impractical, or impossible to capture on film. Visual effects are processes used to manipulate imagery world which is manipulated in postproduction house.

This video will provide a brief overview of this course.

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Course outcomes

Upon completion of preparation of digital images using media technologies you will be able to:

- Understand the structure of digital images, pixel, greyscale and colour images
- Understand the basics of image file formats
- Blend two different exposures of the same scene combined to get the best parts of both images.
- Learn about Computer generated Imagery CGI
- Learn importance of visual effects shots

Timeframe

This course will be completed within “2” classes.
This course is of “2” credits.
4 Hours of study time is required for this unit.

Study skills

This is a combination of theory and practical.
Hence, you should have access to personal computer or personal laptop for better understanding of this unit.
Each and every option is explained step by step in the course material.
Apart from this course material, the learner has to adopt the tendency of learning from multiple sources i.e.;
Internet tutorials
Video tutorials on YouTube
Collaboration with people working in the industry etc.
Only classroom study will not make you a professional. You have to be
active to grab the opportunity of learning wherever you get a chance.

**Need help?**

In case of any help needed you can browse the internet sites like youtube.com for video tutorials about the subject.

**Assignments**

There will be some assignments at the end of each unit.

These assignments are mostly practical based and should be submitted in CD or DVD. Theoretical assignments are to be submitted neatly written on A4 size sheet.

All assignments will be submitted to respective study centre of Odisha State Open University or as directed by Co-ordinator.

All assignments should be unit wise on separate CD/DVDs clearly mentioning course title and unit on Top. Theoretical Assignment will be neatly filed or spiral bind with cover clearly mentioning necessary information of course, student detain on top.

**Assessments**

There will be “1” assessments for each unit.

All practical assessment will be submitted to OSOU.

Assessment will take place once at the end of each unit.

Learner will be allowed to complete the assessment within stipulated time frame given by the university.
Video Resources

This study material comes with additional online resources in the form of videos. As videos put in human element to e-learning at the same time demonstrating the concepts visually also improves the overall learning experience.

You can download any QR code reader from Google Play to view the videos embedded in the course or type the URL on a web browser.
While working through this Course material you will notice the frequent use of margin icons. These icons serve to “signpost” a particular piece of text, a new task or change in activity; they have been included to help you to find your way around this Course material.

A complete icon set is shown below. We suggest that you familiarize yourself with the icons and their meaning before starting your study.
Unit-1

Working with Digital Images

Introduction

Digital images have a “structure”—that is, they are built up from basic elements that are assembled in particular ways to make up a digital image. The basic unit of a digital image is the pixel, and these pixels are arranged into arrays and those arrays are arranged into one or more layers. In this unit, we will take a tour of the pixels, arrays, and layers to see how they make up a digital image.

Outcomes

Upon completion of this unit you will be able to:

- Understand Digital image, its aspects and functions
- Understand the structure of digital images, pixel, greyscale and colour images
- Understand the importance of image resolution
- Understand the texture of images

Terminology

Digital image: A digital image is a numeric representation, normally binary, of a two-dimensional image. Depending on whether the image resolution is fixed, it may be of vector or raster type.

Pixel: Pixels are the Digital images that are bifurcated in to small tiles of separate colours.
**Greyscale:** Grey as the name suggests are the images with Black and White texture, single channel images, and one colour (monochrome) images.

**Colour images:** These are the form of digital images that are used to deploy colour to the human eyes.

**RGB:** The RGB color model is an additive color model in which red, green and blue light are added together in various ways to reproduce a broad array of colors.

**CMYK:** The CMYK color model (process color, four colors) is a subtractive color model, used in color printing.

**Resolution:** The quality of being determined or resolute

**Textures:** The projection of two-dimensional digital images in a three-dimensional object.

**Aspect Ratio:** Any images aspect ratio can be referred as the proportional ratio of its height and width.

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**Structure of digital images**

Digital images maintains a "structure"—that is, they are developed from fundamental components that are gathered in specific ways to create a digital image. Pixel is the essential unit of a digital image, and these pixels are organized into arrays and further the arrays are organized into one or multiple layers. In the accompanying, we take a voyage through those pixels, clusters, and layers to perceive how they together form a digital image.

**The Pixel**

Pixels are type of the Digital images that are further breached down in to small “tiles” of single colour. It’s essential for the computer to have the capacity to get to every one independently keeping in mind the end goal to control it. Every pixel is likewise loaded with at least single strong shading or colour. At the point
when the pixels are sufficiently little they mix together to frame a smooth picture to the eye, for example, the case of Marcie, Kodak's well known film young lady found in Figure 1-1. Notwithstanding, on the off chance that you draw nearer than the ordinary survey remove, you may begin to see her pixels, as in Figure 1-2. On the off chance that you get truly close, you can clearly see her pixels as shown in Figure 1-3.

![Fig 1.1 close up](https://www.pexels.com/photo/close-up-photography-of-woman-wearing-red-lipsticks-765193/)

**Title**-Pixel  
**Attribution**- Pexels.com  
**Source**- Pexels.com  
**Link**- https://www.pexels.com/photo/close-up-photography-of-woman-wearing-red-lipsticks-765193/  

Basically Pixels have two important traits fundamental to the computer.

First To begin with, they are composed in flawless little rows and columns like a checkerboard, and in the land of computer this is known as array. After the pixels get organized into an array kin this manner its mandatory for the computer to have the capacity to find them. There are two positions

a) The classic horizontal direction: The horizontal position of a pixel in an array is referred to as its position in “X”.

b) The classic vertical direction: its vertical position is referred to as “Y”.

By this way each pixel is provided with aspecific location, or “address,” in X and Y. or instance, in the event that you had a picture that was 100 pixels wide and 100 pixels tall, you could distinguish the correct area of a particular pixel by saying it was 50 columns more than (50 in X) and 10 rows down (10 in Y). In short it could be said its XY location is 50, 10. This pixel will be different
from its neighbour that is present, one column to the right at 51, 10, or in the row below at 50, 11. Indeed, every pixel will have a specific XY location in the image and can be denoted by the computer, in the same manner, which it is.

The next important trait is that a pixel is having its single colour. As defined a pixel is all one solitary colour. In a pixel variation of colour or textures are not permitted. Every pixels colour is represented by a number. Truth be told, pixels are basically sets of defined numbers representing colours that are organized in clear rows and columns. They are turned in to picture only when the numbers are converted into colours by a display device like TV set or computer monitor.

*The word Pixel is gotten from "pix" a slang truncation for "pictures", and "el" originates from "component", so the pixel signifies "picture component".

**Greyscale Images**

*Black and white images, one channel images, and monochrome (one color) images are the other names of Greyscale Images. The assortment of names is because of the way that few diverse technical disciplines have built up their own terms to depict a similar thing. Historically it emerges from many discipline so thisoccurs frequently in computer graphics. Here we shall call them as greyscale images for better clarification and brevity. Due to their simple attribute Greyscale images are used commonly in computer graphics, they are a perfectmethod to effortlessly approach the subject of digital images. They exhibit just a single channel, or layer, whereas color images have three channels or more, which we shall come across shortly.*

Digitization of a black and white picture can be one case of a greyscale image is, and the next more pertaining caseare the majority of the *mattes* on the planet Mattes may be utilized to compose one picture above the other. The latter cases are outlined in Figure 1-4. These pictures don’t have any colour as they are greyscale images. Even though differences in appearance of the two images the common is that both of them are one-channel images. Here one channel, or layer, implies that the images comprised of only one array of pixels with the values of brightness ranges from black to white and shades of grey.
Greyscale image Close up pixels Matte Close up pixels

Fig 1.4 Examples of greyscale images and their pixels

Fig 1.5 An array of pixels

When we see this one channel array of pixel it can be interpreted as close and personal, Figure 1-5 zooms in to a tiny little region of pixels in the greyscale image of Figure 1-4. The numbers in Figure 1-5 are the code values of each pixel. These can be referred as code values on the grounds that encoding or measuring the numerical values, the splendor of every pixel. The dim chip that each numerical values encode, or quantify, the brightness of each pixel. The grey chip that each code value sits on speaks to how brilliant that pixel will show up when shown on a screen. Internally the computer utilizes the code values that are arranged in to an array for representation of the picture. The important thing here to focus is that just one array of code values exists, which is known as a channel, and the code values are concerned only with brightness, and not colour.
Color Images

In the actual world our eyes can see the entire spectrum or range of colour however in reality our eyes, are sensitized for three colors of light that is red, green, and blue. Since our brain "blends" segments of these three hues we could see other colours like yellow, magenta, and cyan. Take an example, red and green are blended to get yellow. A similar trap is utilized as a part of the majority of our picture are displayed in devices such as television, led panel displays, digital projectors, and feature film. Actually all these gadgets projects only red, green and blue colours that is coordinated in our brain and integrated as each and every colour shades of the rainbow. To make a colour display device for humans, all you need is red, green, and blue, which is abbreviated RGB.

Until and unless the digital images have RGB data on them the human eyes could not see the colours of digital images displayed over the screen. In the past segment, we came across about the working of the greyscale images, the way it uses its solitary single channel and since it’s been made from the arrangement of numbers in single array that in turn represents the brightness values of the pixel from black to white.

By and large now we will be using three channels and now we can assign one of these colours to each channel, say one to red, other to green and last to blue. Now we can put distinct code values in these three channels of each pixel which in turn is going to enable us to allocate a specific RGB code value to every pixel. This scheme will allow us to assign a unique RGB code value to each pixel in our colour image by putting different code values in the red, green, and blue channels of each colour pixel. We now have a colour image composed of three channels, which is referred to as an RGB image, as illustrated in Figure 1-6. Note how the yellow paint cans
in the RGB image appear bright in the red channel, medium in the green channel, and dark in the blue channel. Having these different values in each channel is what gives the image its colours.

Even though in the RGB image every channels data represents different values of red, green or blue colour pixel per pixel but if we see the data the data is in different hues of grey. This is because of the reason that the different shades of grey depicts the amount of brightness of that particular channel of every pixel. You could observe this in the Figure 1-7:

If we see the extreme left you could see the red pixel, containing the red chip coded as “R” appears to be very bright whereas the Green and Blue pixel consisting of green and blue chips, coded as

Suppose there is plenty of red and minute amount of green and blue that indicates the colour is red. next to the red we have yellow pixel that has bright R and G values above it, but a low (dark) B value, which is the quintessential definition of yellow. The skin tone chip shows a more typical RGB combination to make a common skin tone color. Lastly the grey pixel demonstrates a unique case. In the event that every one of the three of the RGB esteems are the same, than grey color is produced. Indeed, this defines grey that every one of the three channels having parallel estimations of brightness. At the point when the RGB estimations of a pixel happens to be unique in relation to each other, this
forms hues or colour.

Fig 1.8 Grey RGB data gets it colour from the display device

In an event that the RGB information is entirely grey or in black and white, than from where the the colours are visible in a coloured image? The answer is the generation of the colour is originated from display like digital projector, TV, LED screen, etc. As shown in Figure 1-8. For instance in a digital projector for the red channel the grey data is feeded to the red lamp of a digital projector as a result of which the whole screen is filled with adequate amount of red light at every pixel. Same way The green and blue data go to their respective lamps. after this all the images of red, blue and green superimpose on each other that makes the eyes to see the colour. Important aspect here is to be noted basically a colour image is a three channel image where in each channel it consists of distinct RGB data in every channel The key point to note from this is a shading picture is a three-channel picture that contains isolate RGB information into each channel, but the data in these channels is, indeed grey.

Adobe Photoshop will conveniently outline now. To visualise the effect upload a color photographic kind picture into Photoshop (not a convenient graphic). Select the Channels palette (it should be noted in the Photoshop software also they are called as channels), at that point close up the visibility (the eyeball icon) for every channel with the exception of the Red channel. You ought to be watching a gray image. Currently click on the inexperienced channel and view the other, however completely different, grey image. Attempt the Blue channel. It’s completely different another time. It’s vital to consider RGB pictures as 3 channels
of grey data just since that's however the PC thinks of them. To master digital compositing, you would like to understand however the PC assumes therefore you'll think over it.

**Four-Channel Images**

A three-channel RGB image will be made as a four-channel image if a matte is enclosed within it that's placed in an exceedingly fourth channel. This newly formed four-channel image is named as *alpha channel* that is denoted by letter “A,” and then onward this four-channel image is named as a RGBA image.

A three-channel RGB image can have a matte included with it that is placed in a fourth channel, making it a four-channel image. This fourth channel is called the *alpha channel*, which is represented by the letter “A,” so a four-channel image is referred to as a RGBA image. CGI is a case of an RGBA image, it is displayed in Figure 1-9. Likewise its totally conceivable to have pictures with more than four channels, yet you will plausible experience them later in your profession..

![RGBA image](image)

**Fig 1.9 A four channel RGBA image**

**Attributes of digital images**

Now that we have already discussed about the digital images models or structures, additionally we could investigate the different characteristics of digital images. Not only they appear in different shapes and sizes but also, in the internal representation of the image and data variations exists. So this segment will
basically begin with digitizing an image in order to know about it. After that we shall know in length about the distinction between display aspect ratio image aspect ratio, and pixel aspect ratio—3 extremely confusing ideas. This will elaborate all the essential points and clarify all doubts.

**Digitizing Images**

Despite the fact that they play out a tremendous assortment of capacities, by the day's end, whatever they can do is control numbers (in addition to a little Boolean logic en route). Thus, they take a shot at must be changed over to numbers or whatever we load or feed in is lessened to numbers. Even if to create a text file such as an text message, email, a book or a word processor document each letter of the alphabet is assigned with a defined number. The audio files after conversion to numbers to create MP3 files only could be played or listened over DVDs, iPods, and other MP3-enabled devices. In addition, the photos must be changed over to numbers before the PC can work with them. On the off chance that it isn’t first changed over to numbers, the PC basically can’t manage it.

When a picture or an audio say a sound track is converted in to numbers or digits the phenomenon known as *digitizing*. After completion of the digitization of the image, a PC after having the digitized image, any work becomes possible. The two important concept that should be clear on digitizing images are:

- The first is how the entire process is done.
- The second are what issues occurred during the process and how to resolve them.

Following example will explain both points on analysis of the digitized image.
Image Resolution

Dot per pixel or DPI is thought as resolution. Image resolution refers to how many pixels wide and the way many pixels tall image is. Let’s say, if a picture were three hundred pixels wide and three hundred pixels tall, the image resolution would be 300 by 300, or written as $300 \times 300$. The PAL video image features a resolution of $720 \times 576$ component. A regular academy aperture feature frame has a picture resolution of $1828 \times 1332$. The pictures from a photographic camera might need a picture resolution of $3072 \times 2048$ or additional.

Notice that nothing was mentioned about the “size” of the image. This is on account of the real display size of a picture changes relying upon the display device it is seen on. The display size can vary, but the NTSC and PAL image resolution remains the same i.e. $720 \times 486$ & $720 \times 576$ respectively. Say the projection of a small movie or a feature film, can be done on a small screen in a small theatre, or on a huge screen in a large auditorium. Here again the difference is in display size, but in case of a 35 mm film image resolution remains intact and same. We do need to be cautious here in light of the fact that the term resolution has an altogether different meaning in other disciplines. The typical significance for the word outside of digital compositing isn’t what number of pixels are there in the whole picture, yet what number of pixels are there in per unit of display—that is, what number of pixels per inch or dots per centimetre.

Image Aspect Ratio

The aspect ratio of an image is defined by the aspect ratio of a picture is really a portrayal not of its size or its resolution, but rather of its shape. It depicts whether the picture is tall, thin, or low and wide. Each picture on your PC will have a built up aspect proportion, and image resolution, and all your work must comply with it. The aspect ratio is essentially the proportion of the picture's width to its tallness, so it is computed by partitioning the picture's width by its height. For example, if the image resolution is $400 \times 300$, divide 400 by 300 the aspect ratio thus obtained will be $1.33$, the classic video resolution. It should be noted that the image aspect ratio can be applied on image file, but by this it could not be predicted that how it’s going to look on the final display. There are instances that the image aspect ratio and its display aspect ratio may differ. We will discuss this in coming topics.
Pixel Aspect Ratio

As we know that the digital images contains pixels. As in images the pixels have a defined shape which is again denoted by its image-aspect ratio. You should make a point that all pixels are not equal. Like in a square pixel, same as a square image, shall have a pixel aspect ratio of 1.0, however there are lot of display systems that don’t have square pixels. Figure 1-13 shows the non-square pixel aspect ratios you may commonly come across in production.

Explaination of the above figure:

The left example shows an NTSC (American television) video pixel that has a pixel aspect ratio of 0.9, making it tall and thin.

The middle image describes a PAL (European television) video pixel that has a pixel aspect ratio of 1.1, that makes it short and wide.

Generally square pixels are found in many feature film format, but the Cinema Scope (Cscope) format is a specific widescreen format that has a pixel aspect ratio of 2.0, making its pixels too wide. Luckily, video formats of all HDTV (High Definition Television) consists of square pixels.

Display Aspect Ratio

So by this time it’s been clear that the image aspect ratio depicts the image shape and the pixel aspect ratio depicts the pixels shape. And these two factors integrate and referred as the display aspect ratio i.e. the images shape after being projected through a display device. The significance of the Display aspect ratio is that, there may be variance in the aspect ratio of the image and the display device on which the image is displayed. This variation is caused because of the pixel aspect ratio. If the pixels are square,
then the image aspect ratio and the display aspect ratio are identical.

**Texture**

When two-dimensional color pictures are projected in three-dimensional object it is known as texture. A 3D model of the scene can be constructed from a single image, without knowing the layout of common surfaces of the scene, as done in previous works. The understanding of texture of objects improves object detection.

Scene interpretation is a long-standing, basic problem in computer vision. Recent work demonstrates that a synergistic treatment of diverse image-understanding tasks, including object recognition, image segmentation, and 3D-scene reconstruction, may overcome many errors induced by addressing them in isolation. These approaches typically fuse object detections with supervised priors of spatial layouts of common scene surfaces (e.g., the sky is on the top, and the ground is planar and horizontal).

While holistic scene interpretation shows great promise, the treatment of the 3D scene layout in existing work has certain shortcomings. First, they make the restrictive assumption that surfaces in the scene are planar, and discredited surface orientations into a pre-specified number of classes (e.g., buildings may face only left, right, or front). Second, they typically estimate surface orientation classes too locally (e.g., per each super pixel), without accounting for the long-range spatial relations among image parts. This may easily lead to implausible 3D layouts.

One visual cue that has been overlooked, and that could address the aforementioned shortcomings of prior work, is texture arising from a spatial repetition of objects in the scene. In general, textures of recurring objects are ubiquitous. For example, windows on a building facade jointly give the percept of window texture, and a sequence of cars parked along a street gives rise to car texture, as illustrated in Fig 1. In a cafeteria scene, tables and chairs, and people standing in a line comprise many distinct textures. Also, in natural scenes, one can easily find textures corresponding to flocks of birds, herds of animals, or tree lines.
Summary

This unit gave an introduction to the basics of digital images. It elaborated the structure of digital images and other key elements like pixels, greyscale images, colored images, RGB and four scale images. It also discussed the various attributes of the digital images like, digitizing images, image resolution, image aspect ratio display aspect ratio and the basics of image texture.

Assessments

1. What are pixels?
2. RGB is made of how many channels? Mention them.
3. What is image aspect ratio?
4. What is picture aspect ratio?
5. What is display aspect ratio?

Resources

Unit 2

Managing file formats for Images

Introduction

We come across lot of images and each image is either shared or received by us or deliver to a client or colleague. These images are present in the form of a file, and files are available in a massive form of completely different formats. It’s a true facility in front of you, where you have to apply your wisdom while choosing the file formats. We should be cautious about the selection because of the following reasons:

Firstly because if you send a file or receive a file from someone in a specific format that the software or programme could not read, you will be lost and end your start there itself.

Secondly if you choose the file formats via which your image file get compressed than the image quality may be compromised or degraded. Sometimes your selection may work and sometimes it may not work.

Thirdly, if you pick a wrong file format the file size may increase, more than your requirement. Many people don’t want to unnecessary waste their disk space, download time, network bandwidth, and production time.

Outcomes

Upon completion of this unit you will be able to:

- Understand the basics of image file formats
- Understand the basics of file compression
- Realize the importance of Dots per inch in digital images
- Know the basics of EXR
Terminology

**File:** A computer file is a computer resource for recording data discretely in a computer storage device. Just as words can be written to paper, so can information be written to a computer file.

**File Format:** A file format is a standard way that information is encoded for storage in a computer file.

**Graphics:** Graphics are simple images created or drawn with designing software’s.

**Photographic images:** These are real scenes captured by some kind of camera, either digital or film.

**EXR:** It is a floating-point image file format developed by Industrial Light & Magic (ILM).

**JPEG:** JPEG or Joint Photographic Experts Group is an older lossy compression file format specifically designed for photographic images.

**Compression:** It reduces the size of the file so that it can be shared conveniently.

**DPI:** DPI is used to describe the resolution number of dots per inch in a digital print.

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**Image file formats**

Before taking a gander at the file formats, there are a couple of key ideas to think about certain picture writes and pressure plans. In this segment, we will investigate the contrasts between photographic pictures and designs on the grounds that the kind of picture you have powerfully influences the decision of the pressure plot. The EXR file formats gets its own particular extraordinary say due to its rising significance in the visual impacts industry.
Photographic Images vs. Graphics

There are extremely two noteworthy kinds of images: Photographic images and graphic images. Photographic images are genuine scenes caught by some sort of camera, either digital or film. Their key element is that their pixel values fluctuate significantly everywhere throughout the picture, in this way making them "complex." Graphics, then again, are straightforward images made or drawn with designing programming’s, for example, Adobe Photoshop, Adobe Illustrator, Coral Draw, indesign, and so forth. The key component is that their pixel values don't fluctuate more over the image.

Fig 2.1 Pictures and graphics have very different pixels variations

Figure 2.1 shows this significant distinction between the two kinds of pictures at the pixel level. In the nearby of photo, no two pixels are of a similar shading (colour). In the graphic close-up there are substantial regions of indistinguishable pixel values. These distinctions are utilized while choosing a compression scheme. A lossless sort of compression would be utilized on the realistic in light of the fact that the document size could be packed by exploiting every one of the pixels of a similar esteem. Such a plan would be futile on the photo and result in for all intents and purposes no document size lessening. A lossy pressure plan would detectably harm the graphic, yet can go unnoticed in the photo if not squeezed too far.

Indexed Color Images (CLUT)

Fig 2.2 an indexed color image

The document size of any RGB image can be extensively diminished by changing over it to an ordered shading image. The PC initially completes a factual examination of all the RGB hues in the image and afterward delivers a Look-Up Table (LUT) of just 256 hues, which speak to the nearest 256 midpoints of the
considerable number of hues in the RGB image. It at that point makes a one-channel 8-bit "index" image where every pixel is extremely a pointer or index to one of the hues in the shading(colour) table. To show the image in colour the PC takes a gander at every pixel in the index image, takes after that file to its shading chip in the LUT, understands that RGB esteem, and shows it on the screen as the red arrows appear in Figure 2.2

Despite the fact that the scope of hues is genuinely lessened (256 hues rather than 16 million), the subsequent colours image looks shockingly great (in the event that you don't look too carefully). The Marcie colours image in Figure 2-2 is a genuine index colours image. this is because the look is so great is that the 256 hues in the LUT are full 24-bit RGB esteems. Since there are just 256 of them, they don't expand the file size extensively. A typical shortening for index colours images is CLUT, that represents Color Look up Table.

CLUT images work exceptionally well for graphics, particularly if the graphics has under 256 hues in it. The CLUT form would then be a lossless pressure. Photographic images can be changed over to a CLUT, obviously, yet they get severely pounded all the while during the process. it might be OK for a website, however not for printing a 8 × 10 portrait.

Compression

All file formats offer some sort of data compression feature. A few sorts of data compression are lossless, implying that as soon as the compressed file is opened, the image is a correct imitation of the first. Be that as it may, some compression schemes are lossy, implying that the compressed image has endured a few misfortunes, or corruption.

Two transcendent lossless compression plans are RLE and LZW. Run Length Encoding (RLE), which is quite often utilized for rendering CGI pictures; and, Lempel-Ziv-Welch (LZW), that is essential since it is accessible in a considerable number image file formats. Since these are lossless compression plans, they lessen file measure with no debasement of the image; moreover, they can likewise be utilized together. Utilize them unreservedly on CGI and graphics realizing that they won't hurt your photos. Photographic pictures can utilize LZW, however there will be negligible compression.
Two transcendent lossy compression plans are JPEG and MPEG-2. The JPEG compression is proposed for still photographic pictures and fundamentally evacuates fine detail in the picture to lessen its file size. It debases the picture quality, and if set too high can corrupt it genuinely. The MPEG-2 compression is particularly intended for moving pictures, for example, video. It begins by playing out a JPEG-type compression on chosen key frames, and after that it shrinks the middle frames by developing a rundown of distinctions between the key frames.

**EXR**

Open EXR, or EXR, is a drifting point image file format created by Industrial Light and Magic (ILM) that is quick turning into an industry standard. It’s likely that you may experience it right off the bat in your digital compositing vocation and more probable after some time, so how about we investigate it intently. The following area discusses the different essential image file formats, however EXR is both remarkable and sufficiently vital to get its own spot in the sun, particularly in light of the fact that it was particularly created in viewing the compositors. Here is an outline of its primary highlights:

- **High powerful range:** - Designed particularly to oblige high unique range image data, for example, film checks and photorealistic CGI components. The dynamic range (darkest to brightest) of a normal screen may be around 150 to one and projected film maybe 2000 to one, whereas EXR's dynamic range is over a billion to one!

- **Many channels:** - when the basic CGI render is a four-channel image, EXR is expandable to any number of channels. The reason for existing is to abstain from rendering the many obstacles or passes of a CGI subject into multiple separate files. They would all be able to be in their own channels inside one EXR file.

- **Lossless compression:** - Designed for including feature film work, film outlines are extensive photographic images that take up a considerable disk space and network or system exchange time. A special lossless compression plot is bolstered that slices file sizes down the middle with no corruption to the image and it is quick to compress and uncompress.
• Short float: A floating point format, however rather than the standard 32-bit drift, actualizes a novel 16-bit "short buoy." This understands the speed punishment as a rule related with floating point, while keeping up all that could possibly be needed exactness notwithstanding for include film work. At the end of the day, it gives a speed of number with the exactness of float.

Open EXR was discharged by ILM to the world as an open standard for nothing in 2003 keeping in mind the end goal to quickly spread it into the visual impacts industry. It has worked. Many 3D animation and compositing programs now bolster EXR. It has even entered to the omnipresent programming resembles Adobe After Effects and Adobe Photoshop.

File Formats

We can't talk about each file format in the entire library as that would be a whole epic book. Rather this topic comprise of a leniently concise portrayal of a few of the most widely recognized and imperative file formats we go over regularly being a compositor.

As we are well aware that in order to recognize an image we need to add extension to the file name to know what is the format that the file belongs to. In the event that the file is in TIFF format, for instance, the file name will appear as "filename.tif," a JPEG picture would be named "filename.jpg," et cetera. In view of this, the file formats are recorded beneath in sequential order arrange in view of their filename expansions.

• .bmp: An adaptable Microsoft Windows image file format that backs the two photos and graphics. These images are saved as 8 or 16 bits, BW, RGB, RGBA, and CLUT. No compression.

• .cin: Cineon is a more seasoned, extremely particular file format particularly for 10-bit log film scans. No compression, no choices, and nothing specific. It underpins BW, RGB, and RGBA pictures.

• .dpx: Digital Picture Exchange, a newly introduced file format for 10-bit log film scans that is supplanting the Cineon format. Assists numerous channels, linear and log data, and multiple bit depths. sometimes HDTV video frames are saved in the .dpx format.
• .exr: Short form of Open EXR, Industrial Light and Magic's (ILM) broadened extensive range file format basically designed to work for images of feature film. It highlights floating point information and the colossal vibrant scope of hue and bright required for top-quality element film work.

• .gif: Most generally observed as a 8-bit CLUT file format basically used for graphics that is broadly utilized for the web. Incorporates assist for animation in a single file and doles out one CLUT hue for hard-edged transparency. It additionally assists 8-and 16-bit images, BW, RGB with lossless compression, yet no one appears to mind.

• .jpg: JPEG, or Joint Photographic Experts Group, is a more established lossy compression file format particularly intended for photographic images. The fundamental component is the capacity to dial in the measure of compression to influence the file to estimate smaller, which likewise influences how much image data is lost. Unreasonable compression causes genuine loss of image quality and presents antiques or artifacts.

• .jp2: JPEG 2000, a more up to date lossy compression file format, which is additionally particularly intended for photographic images. In view of a totally unexpected innovation in comparison to JPEG, it compresses image files to a littler size while presenting less rarities or artifacts.

• .mov: Apple's pervasive QuickTime motion image file format is utilized to store moving images. The QuickTime file format is really a "wrapper" that assists a not insignificant rundown of conceivable compression plans called codecs (Coder/Decoder). While numerous projects can read QuickTime films, inconvenience comes when the motion picture (movie) is packed with a codec that the program endeavoring to peruse or read the file doesn't have.

• .png: The Microsoft Windows variant of a .gif file that assists genuine transparency.
• .psd: Adobe Photoshop file format that assists isolate layers for the different components of an image. Expected for Photoshop image altering, it isn't assisted by numerous different projects.

• .tga: Targa, a Microsoft Windows-based file format that assists CLUT, BW, RGB, RGBA, 8 bits for each channel, and lossless compression.

• .tiff: TIFF, the most vital image file format in light of the fact that it is assisted by for all intents and purposes each digital imaging program in the whole world. It is a to a great degree adaptable and completely attributed file format that assists various channels, 8-and 16-bit images, and lossless compression. Perfect for CLUT, BW, RGB, RGBA, illustrations, photos, CGI, and practically every other image write aside from a compacted photo (utilize JPEG or JPEG 2000).

• .yuv: A file format particularly for video frames. Numerous projects can read .yuv files and change over them to RGB for show on the screen, and the resulted outcome will be a .yuv file.

Dots per inch (dpi)

The idea of dpi is utilized as a part of print media for books and magazines and so forth. It is vital to talk about dpi, or "dabs per inch," while examining computerized images is basically on the grounds that it is a consistent wellspring of perplexity and confusion in visual impacts. Dpi is likewise appeared in Adobe Photoshop in the Image Size dialogue box as “Resolution.” with regards to printing, resolution implies what number of pixels are printed per inch of paper. With regards to advanced compositing, determination implies the width and tallness of a image in pixels.

In the event that you have a image that is 100 pixels wide and it will be imprinted in a magazine as a 1-inch wide image, you would clearly have 100 pixels spread crosswise over one inch of paper. In this way, the photo would have a print determination of 100 pixels for each inch. For respecting print custom, it would really be alluded to as 100 dpi (dabs per inch). Presently assume you have a 500-pixel image and its print will be a five inch image. The resolution would even now be 100 dpi in light of the fact that in one inch of image despite everything you have 100 pixels. Don't bother the way that the photo is five inches wide. In any case, assume your 500-pixel image was printed as a one inch image. You would now have a 500 dpi image since 500 pixels are spread more
than one inch. For a given image width in pixels, the litterer it is printed, the more pixels per inch, the more prominent the dpi. For a settled image measure, the higher the dpi the more honed the image will be. (see Figure 2-3)

![Fig 2.3 Increasing the dpi makes the picture sharper](image)

One can really watch this in real life in Photoshop. Upload a image, and after that go to the "Image Size" dialogue box. To start with, uncheck "Resample Image" present in the bottom side. Now its going to advice Photoshop to not to change the image "Pixel Dimensions: Width or Height" (what we computerized typesetters call image resolution). Presently go to the "Resolution" window and there you enter or change a number and note that the values change the “Document Size: Width and Height”. Next change the values of "Width or Height" and observe the change in the "Resolution "value. What exactly the phenomenon is that the image width and height were locked with the goal that the real pixel counts will not get altered while adjusting the dpi to perceive how
the subsequent image will be printed bigger or littler on paper.

This story has two focuses. The primary point is that if an image is made in Photoshop for a visual impact shot, the question may arise that what the dpi should be. The appropriate response should be dpi is unessential. By this it clarifies that the Width and Height of the image in pixels that are imperative to us. This will jumble some Photoshop specialists whose orientation is more towards printing. Secondary point is that when images are produced from a visual results shot to Photoshop or to print, (for example, PR photographs), this may likewise bring up the issue of the dpi. A casing of film or video from a visual impacts shot has no natural dpi. Which consists of just Width and Height in pixels. But at the time of printing it should be allotted a dpi to set how lengthy the image will be printed. The dpi value and image printing is complementary to each other. The higher the dpi is set the littler the image will print. For instance, if a 600 × 300 image was relegated a dpi of 300 the printout will be 2 inches wide. Be that as it may, on the off chance that it is set at 600 dpi the print will be in one inch of paper.

**Unit Summary**

This unit gave detailed knowledge regarding the Managing File formats for images, import and export techniques. It elaborated the basics of file formats and dots per inch importance in digital images. Also discussed about the photographic images vs Graphics, indexed colour images, EXR; the industry standard and the basics of EXR. It also explained the importance of compression in digital images.

**Assessment**

1. What are indexed colour images?
2. What is the importance of EXR?
3. What are the various digital image file formats?
4. What is DOT and discuss its importance in digital image?
5. What is DPI?
6. True or False
   a. Increasing the DPI makes the image less sharp
   b. GIF is a video format
7. What is full form of the commonly used JPEG format?

Resources

Unit 3

Image Editing with GIMP

Introduction

Gimp is an acronym for GNU Image Manipulation Program. Gimp is a freely distributed piece of software suitable for such tasks as photo retouching, image composition and image authoring. It is an extremely capable piece of software with many capabilities. It can be used as a simple paint program, an expert quality photo retouching program, an online batch processing system, a mass production image renderer, an image format converter and more. Gimp is expandable and extensible. It is designed to be augmented with plug-ins and extensions to do just about anything. The advanced scripting interface allows everything to be easily scripted, from the simplest task to the most complex image manipulation procedures.

This unit will elaborate the various applications of Gimp and demonstrate the step by step process of editing photographs utilizing it.

Outcomes

Upon completion of this unit you will be able to:

- Edit photographs using the advance techniques layer like blend and the exposure tools of the Gimp.
- Blend two different exposures of the same scene combined to get the best parts of both images.
Terminology

GIMP: GIMP (/ɡɪmp/ GIMP) (GNU Image Manipulation Program) is a free and open-source raster graphics editor used for image retouching and editing, free-form drawing, converting between different image formats, and more specialized tasks.

Masking: Layer masks are a fundamental tool in image manipulations. They allow you to selectively modify the opacity (transparency) of the layer they belong to. This differs from the use of the layer Opacity slider as a mask has the ability to selectively modify the opacity of different areas across a single layer.

Quick Mask: The Quick Mask allows you to paint a selection instead of just tracing its outline.

Layers: A GIMP image is as a stack of transparencies: in GIMP terminology, each individual transparency is called a layer.

What is GIMP?

Gimp is an acronym for GNU Image Manipulation Program. Gimp is a freely distributed piece of software suitable for such tasks as photo retouching, image composition and image authoring. It is an extremely capable piece of software with many capabilities. It can be used as a simple paint program, an expert quality photo retouching program, an online batch processing system, a mass production image renderer, an image format converter and more. Gimp is expandable and extensible. It is designed to be augmented with plug-ins and extensions to do just about anything. The advanced scripting interface allows everything to be easily scripted, from the simplest task to the most complex image manipulation procedures.
Features and capabilities

A brief list of Gimp features:

- Full suite of painting tools including brushes, a pencil, an airbrush, cloning, etc.
- Tile-based memory management so image size is limited only by available disk space.
- Sub-pixel sampling for all paint tools for high-quality anti-aliasing.
- Full Alpha channel support.
- Layers and channels.
- A procedural database for calling internal Gimp functions from external programs, such as Script-Fu.
- Advanced scripting capabilities.
- Multiple undo/redo (limited only by disk space).
- Transformation tools including rotate, scale, shear and flip.
- File formats supported include GIF, JPEG, PNG, XPM, TIFF, TGA, MPEG, PS, PDF, PCX, BMP and many others.
- Load, display, convert and save to many file formats.
- Selection tools including rectangle, ellipse, free, fuzzy, bezier and intelligent.
- Plug-ins that allow for the easy addition of new file formats and new effect filters

Basic GIMP Concepts

This section is intended to give you a brief introduction to the basic concepts and terminology you will need to understand in order to use Gimp.

Working with Images

Image types It is tempting to think of an image as something that corresponds with a single display window, or to a single file such as a JPEG file, but really a Gimp image is a rather complicated structure, containing a stack of layers plus several other types of objects: a selection mask, a set of channels, a set of paths, an "undo" history, etc. The most basic property of an image is its mode. There are three possible modes: RGB, greyscale, and indexed.
Quick Mask

The selection tools sometimes show their limits when they have to be used for creating a complex selection. In these cases, using the Quick Mask can make things much easier. Simply put, the Quick Mask allows you to paint a selection instead of just tracing its outline.

Layers

A good way to visualize a GIMP image is as a stack of transparencies: in GIMP terminology, each individual transparency is called a layer. There is no limit, in principle, to the number of layers an image can have: only the amount of memory available on the system. It is not uncommon for advanced users to work with images containing dozens of layers.

The organization of layers in an image is shown by the Layers dialog, which is the second most important type of dialog window in GIMP, after the Main Toolbox. The appearance of the Layers dialog is shown in the adjoining illustration. How it works is described in detail in the Layers Dialog section, but we will touch on some aspects of it here, in relation to the layer properties that they display.

Each open image has at any time a single active drawable. A "drawable" is a GIMP concept that includes layers, but also several other types of things, such as channels, layer masks, and the selection mask. (Basically, a "drawable" is anything that can be drawn on with painting tools.) If a layer is currently active, it is shown highlighted in the Layers dialog, and its name is shown in the status area of the image window. If not, you can activate it by clicking on it. If none of the layers are highlighted, it means the active drawable is something other than a layer. In the menu bar
above an image window, you can find a menu called Layer, containing a number of commands that affect the active layer of the image. The same menu can be accessed by right-clicking in the Layers dialog.

**Undoing**

Almost anything you do to an image in GIMP can be undone. You can undo the most recent action by choosing Edit Undo from the image menu, but this is done so frequently that you really should memorize the keyboard shortcut, Ctrl Z.

Undoing can itself be undone. After having undone an action, you can redo it by choosing Edit Redo from the image menu, or use the keyboard shortcut, Ctrl Y. It is often helpful to judge the effect of an action by repeatedly undoing and redoing it. This is usually very quick, and does not consume any extra resources or alter the undo history, so there is never any harm in it.

If you undo one or more actions and then operate on the image in any way except by using Undo or Redo, it will no longer be possible to redo those actions: they are lost forever. The solution to this, if it creates a problem for you, is to duplicate the image and then operate on the copy. (Not the original, because the undo/redo history is not copied when you duplicate an image.)

**Grids and Guides**

You will probably have it happen many times that you need to place something in an image very precisely, and find that it is not easy to do using a mouse. Often you can get better results by using the arrow keys on the keyboard (which move the affected object one pixel at a time, or 25 pixels if you hold down the Shift key), but GIMP also provides you with two other aids to make positioning easier: grids and guides.

**Image Grid**
Each image has a grid. It is always present, but by default it is not visible until you activate it by toggling View Show Grid in the image menu. If you want grids to be present more often than not, you can change the default behaviour by checking "Show grid" in the Image Window Appearance page of the Preferences dialog. (Note that there are separate settings for Normal Mode and Fullscreen Mode.)

**Guides**

![Screenshot](image.png)

In addition to the image grid, GIMP also gives you a more flexible type of positioning aid: guides. These are horizontal or vertical lines that you create by clicking on one of the rulers and dragging into the image. You can create as many guides as you like, positioned wherever you like. To move a guide after you have created it, activate the Move tool in the Toolbox (or press the M key), you can then click and drag a guide.

To delete a guide, simply drag it outside the image. Holding down the Shift key, you can move everything but a guide, using the guides as an effective alignment aid. As with the grid, you can cause the pointer to snap to nearby guides, by toggling View Snap to Guides in the image menu. If you have a number of guides and they are making it difficult for you to judge the image properly, you can hide them by toggling View Show Guides. It is suggested that you only do this momentarily; otherwise you may get confused the next time you try to create a guide and don't see anything happening.

**Paths**

A path is a one-dimensional curve.
Paths are used for two main purposes:

- A closed path can be converted into a selection.
- An open or closed path can be stroked, that is, painted on the image, in a variety of ways.

Paths can be created and manipulated using the Path tool. Paths, like layers and channels, are components of an image. When an image is saved in GIMP's native XCF file format, any paths it has are saved along with it. The list of paths in an image can be viewed and operated on using the Paths dialog. If you want to move a path from one image to another, you can do so by copying and pasting using the popup menu in the Paths dialog, or by dragging an icon from the Paths dialog into the destination image's window.

**Brushes**

A brush is a set of pixmaps used for painting.
GIMP includes a set of 10 "paint tools", which not only perform operations that you would think of as painting, but also operations such as erasing, copying, smudging, lightening or darkening, etc. All of the paint tools, except the ink tool, use the same set of brushes. The brush pixmaps represent the marks that are made by single "touches" of the brush to the image.

A brush stroke, usually made by moving the pointer across the image with the mouse button held down, produces a series of marks spaced along the trajectory, in a way specified by the characteristics of the brush and the paint tool being used. Brushes can be selected by clicking on an icon in the Brushes dialog. GIMP's current brush is shown in the Brush/Pattern/Gradient area of the Toolbox. Clicking on the brush symbol there is one way of activating the Brushes dialog.

**Gradient**

A gradient is a set of colors arranged in a linear order. The most basic use of gradients is by the Blend tool, sometimes known as the "gradient tool" or "gradient fill tool": it works by filling the selection with colors from a gradient. You have many options to choose from for controlling the way the gradient colors are arranged within the selection. There are also other important ways to use gradients.

![Gradient Example](Screenshot)

When you install GIMP, it comes presupplied with a large number of interesting gradients, and you can add new ones that you create or download from other sources. You can access the full set of available gradients using the Gradients dialog, a dockable dialog that you can either activate when you need it, or keep around as a tab in a dock. The "current gradient", used in most gradient-related operations, is shown in the Brush/Pattern/Gradient area of the Toolbox. Clicking on the gradient symbol in the Toolbox is an
alternative way of bringing up the Gradients dialog.

Patterns

A pattern is an image, usually small, used for filling regions by tiling, that is, by placing copies of the pattern side by side like ceramic tiles. A pattern is said to be tileable if copies of it can be adjoined left-edge-to-right-edge and top-edge-to-bottom-edge without creating obvious seams. Not all useful patterns are tileable, but tileable patterns are nicest for many purposes. (A texture, by the way, is the same thing as a pattern.)

In GIMP there are three main uses for patterns:

- With the Bucket Fill tool, you can choose to fill a region with a pattern instead of a solid color.
- With the Clone tool, you can paint using a pattern, with a wide variety of paintbrush shapes.
- When you stroke a path or selection, you can do it with a pattern instead of a solid color. You can also use the Clone tool as your choice if you stroke the selection using a painting tool.

Palettes

A palette is a set of discrete colors. In GIMP, palettes are used mainly for two purposes:
• They allow you to paint with a selected set of colors, in the same way an oil painter works with colors from a limited number of tubes.

• They form the color maps of indexed images. An indexed image can use a maximum of 256 different colors, but these can be any colors. The color map of an indexed image is called an "indexed palette" in GIMP.

Actually neither of these functions falls very much into the mainstream of GIMP usage: it is possible to do rather sophisticated things in GIMP without ever dealing with palettes. Still, they are something that an advanced user should understand, and even a less advanced user may need to think about them in some situations, as for example when working with GIF files.

**Colormap**

GIMP makes use of two types of palettes. The more noticeable are the type shown in the Palettes dialog: palettes that exist independently of any image. The second type, indexed palettes, forms the color maps of indexed images. Each indexed image has its own private indexed palette, defining the set of colors available in the image: the maximum number of colors allowed in an indexed palette is 256. These palettes are called "indexed" because each color is associated with an index number. (Actually, the colors in ordinary palettes are numbered as well, but the numbers have no functional significance.)

![Screenshot](image)

**Text and Fonts**

One of the greatest improvements of GIMP 2.0 over GIMP 1.2 is in the handling of text. In GIMP 2.0 and 2.2, each text item goes in a
separate Text layer, and you can come back later to the layer and edit the text in it. You can also move the text around in the image, or change the font, or the font size. You can use any font available on your system. You can control justification, indentation, and line spacing.

Actually, you can operate on a text layer in the same ways as any other layer, but doing so often means giving up the ability to edit the text without losing the results of your work.

Files

The GIMP is capable of reading and writing a large variety of graphics file formats. With the exception of GIMP's native XCF file type, file handling is done by plug-ins. Thus, it is relatively easy to extend GIMP to new file types when the need arises. Not all file types are equally good for all purposes. This part of the documentation should help you understand the advantages and disadvantages of each type.

Creating new Files

You can create new files in GIMP by using the following menu item: File New. This opens the Create a new image dialog, where you can modify the initial width and height of the file or using the standard values. More information about this dialog can be found in.

Opening Files

There are several ways of opening an existing image in GIMP:

- Open File The most obvious is to open it using a menu, by choosing File Open from either the Toolbox menu or an image menu. This brings up a File Chooser dialog, allowing you to navigate to the file and click on its name. This
method works well if you know the name of the file you want to open, and where it is located. It is not so convenient if you want to find the file on the basis of a thumbnail.

**Saving Files**

There are several commands for saving images. A list, and information on how to use them, can be found in the section covering the File menu. GIMP allows you to save the images you create in a wide variety of formats.

It is important to realize that the only format capable of saving all of the information in an image, including layers, transparency, etc., is GIMP’s native XCF format. Every other format preserves some image properties and loses others. When you save an image, GIMP tries to let you know about this, but basically it is up to you to understand the capabilities of the format you choose.

**Using the Quickmask**

Open an image or begin a new document;

Activate the Quickmask using the left-bottom button in the image window.

If a selection is present mask is

- JPEG can’t handle transparency
- Flatten Image

The export conversion won’t modify your original image.
initialized with the content of the selection;

Choose any drawing tool. Paint on the Quick Mask using black color to remove selected areas and white color to add selected areas.

You can use grey colors to get partially selected areas. You can also use selection tools and fill these selections with the Bucket Fill tool. This does not destroy the Qmask selections!

Toggle off the Quickmask using the left-bottom button in the image window: the selection will be displayed with its marching ants.

Creating New Layers

There are several ways to create new layers in an image. Here are the most important ones:

Selecting Layer New Layer in the image menu. This brings up a dialog that allows you to set the basic properties of the new layer; see the New Layer dialog section for help with it.

Selecting Layer Duplicate Layer is in the image menu. This creates a new layer that is a perfect copy of the currently active layer, just above the active layer.

When you "cut" or "copy" something, and then paste it using Ctrl-V or Edit Paste, the result is a "floating selection", which is a sort of temporary layer. Before you can do anything else, you either have to anchor the floating selection to an existing layer, or convert it into a normal layer. If you do the latter, the new layer will be sized just large enough to contain the pasted material.

Working with Digital Camera Photos

The Procedure

The basic technique is to create a layer above the image that contains the other exposure of the same scene. Finally, apply a layer mask to the thin layer which makes parts of the image transparent to shown in image below.

Step 1
Here are the two exposures, loaded into GIMP. Sandwich these on different layers and then combine them with a layer mask.
The first decision is which one goes on top. In this case the decision is to put the lighter image on top and the darker one on the bottom. The reason is because these are hand-held shots, and are far from aligned. Move the bottom image until the arch is aligned as best.
Go the image that is going to be on the bottom. Open the Layers dialog (Ctrl+L) and click on the new layer button ( ) to create a new layer.

**Step 3**

Go to the image that is going to be on top. Select all and copy (Ctrl+A then Ctrl+C).

In the Layers dialog, make sure the new layer is selected, then go to the bottom image window and paste (Ctrl+V). In the Layers dialog, click on the anchor button ( ) to anchor the floating image.

**Step 4**
Crank down the opacity of the upper layer so that you can see both images.

If, they are perfectly aligned you can skip the next step. Unless you used a digital capture on a tripod, the images probably need to be aligned. (Even if you had a film camera on a tripod, it is difficult to get two successive scans to feed through in perfect alignment.)

**Step 5**

In the Layers dialog, select the layer you need to move or rotate. In this case it is the lower layer. Using the arrow keys, nudge the
image into alignment. You may need to rotate the image slightly too. When you get close to alignment, zoom in to get a good close-up view and get the best possible fit.

Step 6

Screenshot

In the Layers dialog, right-click on the upper layer and select Add Layer Mask. In the Add Mask Options dialog, select White (Full Opacity) and click OK.

Step 7

Screenshot
Now, to paint black (transparency) onto the layer mask wherever we want the lower image to show through.

To minimize painting time, use the hand-select ("lasso") tool to select a large, hand-drawn region just inside all the borders of the area you want to paint, as shown at right. Then using the fill tool fill the selection with black.

**Step 8**
Next, select a large opaque brush from the Brushes dialog (Dialogs/Brushes), select the Paint tool and begin painting into the mask close to the boundaries of the blend.

Notice that we still have the opacity cranked down on the upper layer so that I can see both layers.
For the very edges, switch to a small, feathered brush and very carefully paint the edges.

While painting, zoom in and out frequently ("=" key to zoom in, "-" key to zoom out) to inspect the work. Don’t worry too much about the borders, since we’ll probably have to touch those up anyway.

**Step 10**
Now the most painstaking part: blending the seams. This is a little tricky due to the different tonalities of the two exposures.

For blending work, the Clone ( ), Smudge ( ), Airbrush ( ) and Blur ( ) are my tools of choice.

Since not sure if these tools have the ability to work across layers (as they do in Photoshop), duplicate the image (Ctrl+D) and flatten the duplicate (Layers -> Flatten Image) and work on it. This has the additional benefit that if ever mess up the blending job too badly can always easily start over at this step.

**Note:** see this tutorial on correcting blown out highlights for another example of using these tools for blending and some useful tips on their use.

Here we have used primarily clone and a touch of smudge to blend the seams of the two exposures.

**Note:** notice the chromatic aberration of the lens in the form of purple fringing at the edge of the arch. These tools are great for dealing with that even if I were not blending two exposures.

**Final Step**

![Screenshot](image)

**Finished**

The image still has some problems with blown out highlights in the sunlight of the rock face. It is also a little too dark in the foreground shadow.
Creating a Contrast Mask

Introduction

This tutorial will show you how to do create a contrast mask for your image in GIMP.

A contrast mask allows you to reduce overall contrast, simultaneously bringing out more detail in highlights and shadows. This may be necessary to obtain a decent print, because prints on paper do not have as much dynamic range as a monitor; if you don’t control the contrast, detail in the highlights may blow out and detail in the shadows can block up and become muddy or even black. You can of course modify your image directly in GIMP to decrease contrast, but the advantage of the contrast mask technique is that it allows you much more precise control, and gives better results.

The basic technique is to create a layer above the image that contains a B&W negative of the image. The images are combined in overlay mode: dark parts with light, light parts with dark. All the while your original image remains blissfully unchanged on its layer.

Giving credit where credit is due: I did not come up with this method. I adapted it for GIMP from a Photoshop tutorial on The Luminous Landscape web site (great photography web site BTW; I recommend it).

The contrast mask technique does some similar things for the exposure as the digital split ND filter and the blended exposures.
techniques. If you feel your image have exposure problems you might want to consider those techniques as well. Each one has different strengths. Occasionally this technique gives unacceptable color shifts in certain images. Sometimes it is just the ticket.

The Procedure

Here is the original example image, loaded into GIMP. The red leaves are a little too dark to make out the detail; if printed, the result would be pretty dark and muddy. At the same time, the yellow flowers have a couple of specular highlights that would probably blow out the detail if printed.

We want to brighten the dark areas a little and darken the light areas a little. In other words, reduce contrast.

Step 1

Open the Layers dialog. Right-click on the Background layer and select Duplicate (there is also a button for this in the bottom button bar of the Layers dialog.

Step 2
Now double-click on the duplicate layer and rename the new layer “Contrast Mask”. (This step is not strictly necessary, but it is helpful to prevent confusion about what is on each layer,
especially if you add some additional layers for other editing purposes).

**Step 3**

**Screenshot**

Select the Contrast Mask layer. Go to the image window and right-click, selecting:

Image → Colors → Desaturate

**Step 4**
Screenshot

Right-click and select
Image → Colors → Invert

You now have a B&W negative image of your original. We’re going to combine this with the original (light with dark, dark with light) to reduce the overall contrast.

Step 5

Screenshot

Go back to the Layers dialog and in the “Mode” drop-down box, select “Overlay”. The result may look better in terms of contrast, but degraded in terms of overall sharpness.

Don’t worry, we’re not done yet.

Step 6
Go back to the image window and right click, selecting Filters → Blur → Gaussian Blur

You will need to experiment to find the best value, but typically a value between 10 and 30 will do nicely. After blurring the contrast mask the overall image should now look much sharper.

Click on the “eye” next to the Contrast Mask layer in the Layers dialog to rapidly compare the image with and without the mask.
Similarly, turn off the Background layer if you want to view the mask to do further work on it.

The image at top left is the original, the top right is with the contrast mask.

**Step 7**

It is informative to see how this technique compares to the conventional technique of using the contrast dialog to adjust contrast. I’ve tried to adjust the contrast to have the leaves appear about the same. I think the image with the contrast mask has a lot more pop! This one looks kind of flat by comparison.

**Step 8**

To see why this is so, compare the histograms of the images. The top one is for the original image, the middle is for the image with
the contrast mask, and the bottom one is for the original image with the conventional contrast adjustment.

Note how the typical contrast adjustment has lost a lot of values at both ends, but the mask technique basically preserved the entire scale.

**Step 9**

**Screenshot**

You’ll have to flatten the image if you are saving it to a typical image format like TIFF or JPEG (but not if you are saving to GIMP’s native XCF format). To do that, right-click on the image and select Layers → Flatten Image

**Fine Tuning**

Now that your contrast mask is created, it’s time to fine tune it. Here are some things you can do:

- Use the “Opacity” slider in the Layers dialog to decrease the effect of the contrast mask overall.
- Apply Levels or Curves to the contrast mask to open up the shadows or reduce the highlights further.
- Apply the dodge and burn tools to the contrast mask.
- Apply a layer mask to the contrast mask and use it to select only parts of the contrast mask; e.g. if you only want the contrast mask to apply to certain areas of the image (see
my example of this below).

**Tips**

- See this article for some informative tests on the effects of the Gaussian Blur step on the contrast mask.

**Other Examples**

*Screenshot*

With a contrast mask as described above. Notice how the sky has recovered some blue, and the detail visible under the tree!
Here’s an example of how this technique overlaps with the digital split ND filter approach. Which do you prefer?
With a digital split ND filter. (1st image)

With a contrast mask as described above, plus a layer mask with a gradient fill, so the contrast mask is mostly applied to the area below the cliffs. (2nd image)

Note particularly the change in the color of the cliffs and the light part of the sky just above the cliffs, in the image using the full
contrast mask (upper right). This shows how a contrast mask affects all parts of the image, unless you selectively disable part of the mask, as I did in the lower right. Note also that with the split ND filter (lower left) I was able to brighten the foreground more; I could apply a general levels tweak to the contrast mask to achieve the same thing, but it seems like more work. This illustrates a general point for me: the digital split ND filter technique is the easier approach when you’re already satisfied with half of the image, whereas the contrast mask is a better starting point if the overall image needs contrast reduction on both the dark and light sides.

**Layer Masks**

**Layer masks** are a fundamental tool in image manipulations. They allow you to selectively modify the opacity (transparency) of the layer they belong to. This differs from the use of the layer Opacity slider as a mask has the ability to selectively modify the opacity of different areas across a single layer.

This modification of a layer’s transparency through a mask is non-destructive to the layer itself.

This flexibility to define the opacity of different areas of a layer is the basis for more interesting image manipulation techniques such as selective coloring and luminosity masking.

**Adding a Mask to a Layer**

Layer masks need to be added to a layer before they can be used. The process for adding them is simple.
Layers dialog for the image.

For this example a simple image is used with only two layers, as shown above. There is a base image at the bottom of the stack and a single layer of teal over it. The teal layer is the active layer (look for the white border), and the one which we will add a layer mask to.

Right-Click on the layer you want to add a mask to (the “Teal” layer in my example), and the Context menu will show an option to Add Layer Mask...:

Add Layer Mask in the context menu.

You can also add a layer mask through the menus:

Layer → Mask → Add Layer Mask...

This will then bring up the “Add a Mask to the Layer” dialog with some options:
There are many options for initializing the Layer Mask. Notice that the first option is to set the entire mask to White, which will result in full opacity on the layer (no transparency from the mask). The option to initialize to Black shows that the mask will make the entire layer fully transparent.

For the purposes of this tutorial, we will let the mask initialize to White (full opacity). You should notice a change in your Layers dialog now that shows the layer mask thumbnail to the right of the layer it applies to (in this case the “Teal” layer):

Layers dialog with mask applied to Teal layer.

The layer mask has now been added to the “Teal” layer. It is also active (there is a white border around the thumbnail in the dialog, but is not visible due to the mask being white as well) and ready for modification.

Modifying a Layers Transparency with the Mask

At this point any operations performed on the canvas will apply to the mask and not to any layers themselves. To illustrate how
masks can affect its layers transparency, let’s paint!

Use the Rectangle Select tool to select roughly the top third of the image, and I’ll fill this selection with black.

Tools → Selection Tools → Rectangle Select

Activating the **Rectangle Select** tool.

Using the Rectangle Select tool, select roughly the top third of the image:

Top third of the image selected.

If you want to fill this selection with black, but before you do you need to make sure that the foreground color is black. Click on the foreground color in the Color area to bring up the

“Change Foreground Color” dialog:

Click the foreground color to change.

The “Change Foreground Color” dialog allows you to set the foreground color. For this example set the color to black, RGB(0, 0, 0):

Change the color to black.

With the foreground color set, you can now use the Bucket Fill Tool to fill in the selection.

Tools → Paint Tools → Bucket Fill
Activating the **Bucket Fill** tool.

You can now click inside the selection to fill it with the foreground color (black). As soon as you do, you’ll be presented with a new view of your image on the canvas:

As you can see, filling the selected portion of the layer mask with black resulted in that area having 100% transparency, showing the layer below it.

If you Rectangle select a different area of the mask, you can fill it in with a different shade of gray to produce a variable opacity. For example, I will select a few different regions of the mask, and fill it with different levels of gray:
If you examine the layer mask, you’ll see that there are different levels of gray being applied (black to white, from top to bottom), and their value is what determines the opacity of the layer.

**Selective Colorization Example**

A good example of the application of layer masks is doing selective colorization of an image (selectively allowing color to show through a mostly black and white image). Walk through how to easily do this with an image from Mardi Gras 2013:
Start the process by duplicating the base image (Shift+Ctrl+D, or Right-Click layer → Duplicate Layer). From the menu:

Layer → Duplicate Layer

Then desaturate the upper layer using:

Colors → Desaturate

Following the steps above, add a layer mask to the desaturated layer and initialize it to White (full opacity). At this point, the Layers dialog should look like this:

As before, set your foreground color to black. This time, rather than filling selections, we are going to use the Paintbrush Tool to paint areas of the image we want the color to show through from the layer below.

I decided to paint the boy on the fence. Using the Paintbrush Tool I painted over his shirt and head. This allowed those colors to show through from the layer below. Here are the results after painting:
Simple Selective Colorization Example

To illustrate what was done, here is the layer mask I painted to achieve the above result:

Of course, you could have chosen a different color than black to create the mask. If you wanted a slightly more muted color I could have painted with a more middle gray vs. black:
Basic Color Curves

Color has this amazing ability to evoke emotional responses from us. From the warm glow of a sunny summer afternoon to a cool refreshing early evening in fall, we associate colors with certain moods, places, feelings, and memories (consciously or not).

Instead, we are going to take a look at the use of the Curves tool in GIMP. Even though GIMP is used to demonstrate these ideas, the principles are generic to just about any RGB curve adjustments.

You’re Pixels and You

First there’s something you need to consider if you haven’t before, and that’s what goes into representing a colored pixel on your screen.

Open up an image in GIMP. Now zoom in.

Nope - don’t be shy now, zoom in more! And there’s your pixel. So let’s investigate what goes into making your pixel.

Remember, each pixel is represented by a combination of 3 colors: Red, Green, and Blue. In GIMP (currently at 8-bit), that means that each RGB color can have a value from 0 - 255, and combining these three colors with varying levels in each channel will result in
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all the colors you can see in your image.

If all three channels have a value of 255 - then the resulting color will be pure white. If all three channels have a value of 0 - then the resulting color will be pure black.

If all three channels have the same value, then you will get a shade of gray (128,128,128 would be a middle gray color for instance).

So now let’s see what goes into making up your pixel:

The RGB components that mix into your final blue pixel.

As you can see, there is more blue than anything else (it is a bluish pixel after all), followed by green, then a dash of red. If we were to change the values of each channel, but kept ratio the same between Red, Green, and Blue, then we would keep the same color and just lighten or darken the pixel by some amount.

Curves: Value

So let’s leave your pixel alone for the time being, and actually have a look at the Curves dialog. I’ll be using this wonderful image by Eric from Flickr.
Opening up my Curves dialog shows me the following:

Colors → Curves...
We can see that I start off with the curve for the Value of the pixels. I could also use the drop down for “Channel” to change to red, green or blue curves if I wanted to. For now let’s look at Value, though.

In the main area of the dialog I am presented with a linear curve, behind which I will see a histogram of the value data for the entire image (showing the amount of each value across my image). Notice a spike in the high values on the right, and a small gap at the brightest values.

What we can do right now is to adjust the values of each pixel in the image using this curve. The best way to visualize it is to remember that the bottom range from black to white represents the current value of the pixels, and the left range is the value to be mapped to.

So to show an example of how this curve will affect your image, suppose I wanted to remap all the values in the image that were in the midtones, and to make them all lighter. I can do this by clicking on the curve near the midtones, and dragging the curve higher in the Y direction:
What this curve does is takes the values around the midtones, and pushes their values to be much lighter than they were. In this case, values around 128 were re-mapped to now be closer to 192.

Because the curve is set Smooth, there will be a gradual transition for all the tones surrounding my point to be pulled in the same direction (this makes for a smoother fall-off as opposed to an abrupt change at one value). Because there is only a single point in the curve right now, this means that all values will be pulled higher.
The results of pushing the midtones of the value curve higher (compare to original).

Care should be taken when fiddling with these curves to not blow things out or destroy detail, of course. We only push the curves here to illustrate what they do.

A very common curve adjustment you may hear about is to apply a slight “S” curve to your values. The effect of this curve would be to darken the dark tones, and to lighten the light tones - in effect
increasing global contrast on your image. For instance, if I click on another point in the curves, and adjust the points to form a shape like so:

A slight “S” curve

This will now cause dark values to become even darker, while the light values get a small boost. The curve still passes through the midpoint, so middle tones will stay closer to what they were.
Slight “S” curve increases global contrast (click for original).

In general, it easiest to visualize in terms of which regions in the curve will affect different tones in your image. Here is a quick way to visualize it (that is true for value as well as RGB curves):
If there is one thing you take away from reading this, let it be the image above.

Curves: Colors

So how does this apply to other channels? Let’s have a look.

The exact same theory applies in the RGB channels as it did with values. The relative positions of the darks, midtones, and lights are still the same in the curve dialog. The primary difference now is that you can control the contribution of color in specific tonal regions of your image.

Value, Red, Green, Blue channel picker.

You choose which channel you want to adjust from the “Channel” drop-down.

To begin demonstrating what happens here it helps to have an idea of generally what effect you would like to apply to your image. This is often the hardest part of adjusting the color tones if you don’t have a clear idea to start with.

For example, perhaps we wanted to “cool” down the shadows of our image. “Cool” shadows are commonly seen during the day in shadows out of direct sunlight. The light that does fall in shadows is mostly reflected light from a bluish sky, so the shadows
will trend slightly more blue.

To try this, let’s adjust the Blue channel to be a little more prominent in the darker tones of our image, but to get back to normal around the midtones and lighter.

![Screenshot of Adjust Color Curves window]

Boosting blues in darker tones
Now, here’s a question: If you wanted to “cool” the darker tones with more blue, what if you wanted to “warm” the lighter tones by adding a little yellow?

Well, there’s no “Yellow” curve to modify, so how to approach that? Have a look at this HSV color wheel below:
The thing to look out for here is that opposite your blue tones on this wheel, you’ll find yellow. In fact, for each of the Red, Green, and Blue channels, the opposite colors on the color wheel will show you what an absence of that color will do to your image. So remember:

Red → Cyan
Green → Magenta
Blue → Yellow

What this means to you while manipulating curves is that if you drag a curve for blue up, you will boost the blue in that region of your image. If instead you drag the curve for blue down, you will be removing blues (or boosting the Yellows in that region of your image).

So to boost the blues in the dark tones, but increase the yellow in the lighter tones, you could create a sort of “reverse” S-curve in the blue channel:
Screenshot

Boost blues in darks, boost yellow in high tones

In the green channel for instance, you can begin to introduce more magenta into the tones by decreasing the curve. So dropping the green curve in the dark tones, and letting it settle back to normal towards the high tones will produce results like this:
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Screenshot
Suppressing the green channel in darks/mids adds a bit of magenta (click for original).

In isolation, these curves are fun to play with, but think that perhaps walking through some actual examples of color toning/grading would help to illustrate what we are talking about here. Choose a couple of common toning examples to show what happens when you begin mixing all three channels up.
Unit Summary

This unit introduced the Gimp and its various applications. We learnt the use of GIMP tool to edit images professionally. It discussed in details about GIMP Express which is used for minor editing and GIMP Editor which is used as a professional image editing tool. It elaborated the use of GIMP to edit image using its various tools like Editing Masking, Colour adjustments, layer masking, etc through tutorials.

Assessment

1. What is GIMP?
2. What are Layers?
3. What are the features & capabilities of GIMP?
4. What are the three different types of color channel?
5. What is Layer masks In GIMP? Give example.
6. What is the use of Bucket Fill Tool?
7. Select a photograph and adjust the colour toning & gradient of that photograph using GIMP.
Resources

2. [www.gimp.org](www.gimp.org)
3. [http://wwwcdf.pd.infn.it/localdoc/gum.pdf](http://wwwcdf.pd.infn.it/localdoc/gum.pdf)
4. All images saved from screenshot which are done manually using the above editors.
5. Some materials referenced from Google. This website states, it is not copyrighted, thus a free material.
Unit 4

Techniques behind VFX

Introduction

Visual effects are processes by which imagery is created or manipulated outside the context of a live action shot. Visual effects involve the integration of live-action footage and generated imagery to create environments which look realistic, but would be dangerous, expensive, impractical, or impossible to capture on film. Visual effects using computer-generated imagery have recently become accessible to the independent filmmaker with the introduction of affordable and easy-to-use animation and compositing software. Visual effects are processes used to manipulate imagery which is manipulated in postproduction house. Visual effects have taken over the kinds of imagery effect or processes which were once dominated called specialeffects. Special effects are effects either created on the camera or by CGI. Both of these processes are employed to take advantage of technology to make imagery that is impossible to find in the real world or far too difficult or may be dangerous. Some shots may be expensive to achieve without the use of visual or special effects.

Outcomes

Upon completion of this unit you will be able to:

- Understand the techniques of VFX
- Understand what is digital composting
- Learn about Computer generated Imagery CGI
- Learn importance of visual effects shots
Terminology

VFX: Visual effects are processes by which imagery is created or manipulated outside the context of a live action shot.

Digital compositing: Digital compositing is the process of digitally assembling multiple images to make a final image, typically for print, motion pictures or screen display. It is the digital analogue of optical film compositing.

CGI: It is the computer generated imaginary.

Chroma: Chroma key compositing or chroma keying, is a visual effects / post-production technique for compositing (layering) two images or video streams together based on color hues (chroma range).

Keying: The portions of the video which match the preselected color are replaced by the alternate background video. This process is commonly known as "keying", "keying out" or simply a "key".

Visual Effects

there were two major special effects categories, in the year 1990 called as Opticaleffects or techniques such as multiple exposures, glass shots, or mattes. Also in this category the effects were also achieved through the optical printer, where footage could be photographed. Even today the optical printing effects are the basis for the software-based effects. The second category is mechanicaleffects, which are effects created on set, in front of the camera, such as with models, props, and make-up.

In the late 1980s, digital compositing developed. Compositing is the demonstration of consolidating two diverse symbolism.
sources; a procedure that was once done on an optical printer is currently upgraded with the more noteworthy control permitted by PCs, at a significantly decreased cost. The mid 1990s saw the start of wide utilization of what is regularly alluded to as CGI or CG. CGI or PC produced symbolism consolidates the procedure of activity with the utilization of photorealistic surfaces to make characters, view, and whatever else the psyche can envision to make what can’t be shot.

In the present visual impacts world, two noteworthy arrangements of systems are utilized to unravel generally issues. Will the shot an executive needs be accomplished by producing designs, joining distinctive wellsprings of film, or utilizing the two procedures?

Digital Compositing

The utilization of advanced compositing has turned out to be so ordinary in present day diversion that it will frequently go totally under the watcher's radar. A case of ordinary compositing is your TV meteorologist. Your meteorologist is remaining before a green screen (or blue screen), which is expelled and supplanted with PC created maps.

Green screens and blue screens are utilized as a part of a procedure called chroma keying or shading keying. The utilization of entering started in the 1930s when a meticulous concoction process, beside a troublesome match up shooting process, was utilized at an awesome cost of time and cash. Be that as it may, with the utilization of video and advanced compositing, the procedure has turned out to be speedy and cheap.

Basically, an on-screen character, or subject, is shot before a screen that is either blue or green. The shading does not need to be blue or green, but rather blue and green are utilized frequently on the grounds that they are in the scope of hues most inverse to human skin. Blue, the inverse of yellow, was the customary decision, which changed over to green when advanced compositing turned into the standard on the grounds that computerized cameras react better to the higher luminance estimations of green. At the point when a film or non-
computerized camcorder is being used, blue is regularly favored. Green is regularly utilized when a shoot happens outside due to the sky.

The shading screen background would then be able to be evacuated. At the point when film is shot digitally, data is put away in discrete shading channels. These will be red, green, and blue. Moreover, there is a fourth channel, the alpha channel. The alpha channel controls the clarity of the shading channels, and in a composite shot the compositor can determine the shading range that will get either a decreased straightforwardness or evacuation. At that point a different bit of film can be put behind the shading keyed shot and the joined shot is done.

Keying isn't the main technique for utilizing the utilization of alpha channels. The utilization of garbage mattes is frequently important to help where shading keys are excessively troublesome. Garbage mattes more often than not allude to the procedure of hand drawing the zone that will have a decreased transparency. The modifier "garbage" alludes to the way that it is typically brief or utilized as a feature of another procedure.

At the point when this isn't utilized as an impermanent or assisted measure, the compositor is said to masking. The motivation behind why this procedure isn't utilized more frequently than shading (colour) keying is because of the way that it more often than not requires alteration frame by frame. Considering film (footage) with a hand-drawn process frame by frame is referred as rotoscoping. Rotoscoping is the way toward reshaping a matte, however it can likewise be utilized to portray a shot that incorporates a hand-drawn or balanced system that requires consideration for every individual edge. In this way, some speedy math, a motion picture has 24 frames for each second (fps) while a TV show or business has around 30 fps. Indeed, on a 30-second commercial that would be 900 different images that a rotoscoper must take care of, which isn't generally alluring in the snappy pivot entertainment surrounding we live in. The digital or computerized compositing world comes furnished with little partners to lessen the requirement for rotoscoping. Motion tracking is one of the example within this. A territory of a picture can be recorded or tracked by the PC with the goal that some different procedure can be utilized to that region. For instance, in the Digital Dismemberment, we can paint out and supplant half of a performing artist's arm. To abstain from rotoscoping, we can put a
dark spot with a marker on our on-screen character’s arm so that the PC can track and afterward something could be joined to that point in its place.

Computer-Generated Imagery

Frequently joined with compositing, the other classification of strategies used to take care of most visual impacts issues is the production of CGI or CG. What this will involve is either assembling a few 2D or 3D dimensional digital (computerized) models that, dissimilar to live performers or actual real locations or scenes can be changed and moved effectively around to accomplish the coveted scene.

While the utilization of CGI scenes started in the late 1970s, what denoted the entry of what has turned out to be exceptionally regular in the present visual impacts is the 1993 super hit film Jurassic Park where CGI dinosaurs were convincingly incorporated into scenes with live performing artists. Presently, that isn't the special case, it's the standard.

Frequently, not simply Pixar characters but rather even sets, helicopters, structures like buildings, and blasts are ordinarily made using PC produced graphics that are composited into scenes. This unit will talk about the procedures for making 2D and 3D designs in After Effects and also Apple's Motion and Autodesk's Combustion, however these projects can just begin to expose what's underneath of the 3D illustrations world, as there are many devoted projects to create and animating 3D characters and universes.

Three-dimensional character movement has to a great extent supplanted the conventional hand-drawn animated characters. In dream type films, for example, the current Star Wars prequel set of three, 300, Sin City, and the Lord of the Rings set of three, performing artists were for the most part shot in blue or green rooms to have 2D-and 3D-rendered sets supplanting the screen foundations. The simplicity of control and the scope of conceivable outcomes have made 3D-rendered sets a perfect decision over the antiquated arrangement of utilizing scale
models. Notwithstanding when scale models are picked by the generation groups, 3D graphics are utilized to improve the models.

Particle systems are utilized to reproduce regular marvels, for example, smoke, fire, rain, snow, and tidy. Basically, similar to a streaming wellspring of pixels, these particles can be controlled to react to true material science at the tact of the VFX craftsman.

The under recognized Power of Available Software

A standout amongst the most generally utilized instruments by VFX craftsmen is something you likely have on your PC as of now, Adobe Photoshop. Initially composed by Thomas Knoll while he was a doctoral scholar, the thought got the consideration of his sibling John Knoll, he has worked in Industrial Light and Magic. John Knoll has turned into a academy award winner and foundation grant champ for his VFX job away at the current Pirates of the Caribbean films and is perceived for his work on numerous different movies that depend on VFX.

Be that as it may, notwithstanding Photoshop's heredity as having an association with the universe of visual impacts, it has viable use as an instrument for VFX specialists. Thought to be the establishment programming for altering any picture on a PC, it's frequently utilized as a part of conjunction with Adobe After Effects. Eventual outcomes reads the different layers of a Photoshop archive and enables the client to apply keyframe style animation of liveliness to them. For painting style impacts, clients will alter pictures from After Effects in Photoshop to have an advantage of Photoshop's unequaled quality with painting instruments and after that arrival the picture to After Effects. The first vision of programming creators of After Effects was to take what Photoshop does and put it on a course of events.

Beside Adobe, Apple has filled their PCs with an awesome number of stunning, proficient programming packages. Apple's Final Cut Pro Studio began as an elective editing framework that overwhelmed the postproduction world. Numerous VFX shots that
once would have required an excursion apart from an editing package can be executed in Final Cut Pro, which utilizes a comparable key framing engine to After Effects. Sparing time and cash numerous VFX issues would now be able to be settled in a similar program that the editing may happen in.

Apple presented Motion in 2004, which later turned out to be a piece of the Final Cut Studio. Created at first to encourage ease the need to leave the Final Cut condition, Motion has developed into a proficient contender to After Effects. It has a few impediments, so it's not exactly a genuine trade for AE till now; be that as it may, it has the solid preferred standpoint of tight combination with Final Cut. These projects are ordinary among an assortment of clients, however frequently their actual potential goes unnoticed in light of the fact that the client doesn't know the procedures to take genuine preferred advantage and support of these projects.

Preparing for your visual effects shot

Here we will examine tips and strategies for setting up a VFX shot. The measure of time spent in preproduction can spare significant hours on the creation and days in postproduction.

An awesome case is like this something. Suppose you're taking a shot at a shoot that requires a bright day, however in preproduction the climate reports were not checked and it's cloudy. So they waited over the set, for the mists to spread, however the mists don't, so they shoot at any cost. Presently regardless of numerous endeavours to cut around the cloudy film, the editor needs the shot. A compositor is brought in to supplant the mists and light up the recording to influence it to look right. Contingent upon the shot, it may take lot of times altogether however in the event that there's loads of movement, it may take much more time. Presently, had the climate been checked, the issue could have been worked around.

Presently every issue can't be expected, and plans must be worked out. In any case, what ought to be maintained a strategic distance from are things that can be dealt with effortlessly on the
preproduction and production levels. You must have heard the joke "we'll settle it in post?" Well, it's not a joke for all, and keeping in mind that numerous issues can be settled in postproduction, for what reason do that when it can be settled by simply changing the framing or, even better, simply going into production with a superior thoroughly considered arrangement.

**Tips for VFX Artists in Preproduction**

Let's see a couple of tips on the best way to help your VFX shot keep running as easily as could be expected.

**Storyboard the Effect**

Film scholars with storyboards don’t go together and they are like oil-and-water association. It's terrible on the grounds that arranging is entirely critical, and in the event that you can envision it, early issues can be expected. We will see exhibit utilizing Photoshop to make storyboards. There are some particular favourable circumstances to storyboarding an impact carefully; utilizing Photoshop you can think of something considerably nearer to the last shot than stick figures.

**Get Your Camera and Do a Test Shoot**

It's really amazing that how could some postproduction people don’t go from their workplace. On the off chance that you realize that you have an impact shot coming up, for what reason not give it a shot? Get the camera and make a test shot. You ought to have some thought of what you would get and provide yourself the chance to expect issues. It’s imperative that the shot be hand-held or bolted off? Is lighting may be an issue? Will you require track focuses? The test film(footage) can be conveyed to VFX specialists, can be tested,tried and utilized for something.

**Show up on Set**
A few directors, if the shot will depend on an impact, will demand a VFX individual being available amid the shoot. Enormous spending Hollywood motion pictures do this, and there's no purpose behind an independent to be any extraordinary. Particularly if the VFX craftsman has done tests as of now, now he/she can exhort or advise on how everything is being finished. Knowing where the issues will shoot, you can yell to the director that maybe a retake is all together, given obviously that the entire team of production compliant to it as instances are there some may or may not comply.

**Research the Technique**

At the point when given a visual impacts venture you ought to have some thought regarding how to work on it. In spite of the fact that, why stick to one process up to your basic knowledge, when you have a universe of information readily available?

Browse the Google and complete a little snappy research. How do individuals take care of this issue? On the off chance that you take after a long-established system for making a specific impact or effect, has the procedure changed?

Generally, character animation in After Effects was finished by bringing the character into Photoshop, cutting every one of the parts up into layers, and afterward bringing in each one of those layers into After Effects, changing all the Anchor Points, and utilizing a complex Parenting plan. Seem like a considerable measure of work? It may be.

At the point when After Effects CS3 turned out, it appeared like a minor update, off-base! One new impact has totally changed the procedure of character animation, the Puppet Tool. Presently you can have full control over a character on a solitary layer. Beside the likelihood that you might not have the best procedure for making an impact, the best methods frequently change.

**Text effects**

In 1994 when *Seven* was released, people were not just blown away by the film itself, but also by the excellent *title sequence*
designed by Kyle Cooper. Title sequences got a huge boost from the enthusiasm for the one seen in Seven. It created a sense of anticipation for the film that would follow; just by the title sequence the audience became unnerved — like, okay what you are about to see is like nothing you’ve seen before. In this section you will see some tutorials on how you can give your film that exciting boost that only the right title sequence can give.

**Title Sequence Workflow**

Even the most utilitarian, functional purpose-only title sequence can have a little style and flair and bring up the level of your production. However, there are ways of overcomplicating a title sequence without some careful considerations for the workflow.

**Ingredients:-**

- The background images for the title sequence.
- Text file with credits listed (in most situations, producers will give the designer a text file with the credits listed).

**Text Background Integration**
This technique has also been used on Heroes, but we’ve seen it a lot in TV commercials. Basically we take generated text layers and make them a part of the scene by taking advantage of 3D space. Typically, actors will walk in front, or on top of our type to make it feel more three-dimensional.

**Ingredients:**
- Footage of actors walking in a fairly large space

**Three-Dimensional Text**

To get that big, triumphant look, nothing does better than 3D text.

![Fig 4.1 3-Dimensional text](image)

**The new glass shot**

A glass shot is a strategy that is to a great degree low tech yet exceptionally viable. Basically, when a movie maker wants to include landscape components and its cost is too high to create set pieces, movie producers would paint the required additional view on a sheet of glass and shoot the performing artists with the glass specifically before the camera. Sounds enchanting and curious, isn't that so? Surprisingly, This procedure was very basic.
at present. In any case, now, on account of computerized digital compositing programming, shots that used to utilize these glass strategies can be balanced carefully with more accuracy and more prominent capacity.

The visual impacts methods talked about here are not intended to hit the watchers beyond understanding; apart these systems not upset the scene. In the wake of taking in these strategies, it's really amazing that how frequently these are utilized and regularly goes unnoticed. On the off chance that the impact is perfectly done, the viewers never loses that suspension of doubt, and these are presumably a portion of the most straightforward to pull off without demonstrating the hand of the VFX artists excessively.

Modifying a Building

Fig 4.2 Modifying building(Created by Author)
Amid creation on a movie, movie makers are regularly in the circumstance of requiring an outside shot that is not existing. Suppose we need to make a world with large messages to our hero so how about we add a bulletin or hoarding to the highest point of a working in Photoshop.

**Requirements:**
- A master shot of the building that ought to be adjusted.
- Another shot with the components to be added to the building.

**Adding Reflections to a Shot**

Regularly hard to shoot, shots containing a reflection can include a little punch and significance to a specific scene. The objects that are reflective will frequently require the hand of the visual impacts specialists to make the shot land precisely as it should.

**Requirements:**
- A master shot of the scene consisting of the reflective surface
- A second shot utilized on the surface that is reflective to demonstrate the reflection we need (this is discretionary as there
will probably be circumstances where the shot as of now contains what we have to reflect)

Sign Replacement
Fig. 4.3 Sign Replacement
(Created by Author)

Signs can be hazardous or a lifeline with regards to building up an location. Signs can be utilized to set a state of mind and recognize an area for a group of people. On the off chance that a sign is
inadequately found or wrong for a film, frequently it should be supplanted. Presently VFX craftsmen make the suitable sign for a scene to catch the mind-set splendidly.

Requirements:-

- A master shot of the sign that will be changed.
- A graphic of a new sign (which will be created in Photoshop).

Removing Objects from the Frame

(Created by Author)
Fig. 4.4 Removing objects from frame.

Regardless of how thorough the moviemaker, the photography director, the area scout, and the entire crew are
there will without a doubt be shots that have subjects in the frame that ought not to be there and can be evacuated.

Requirements:

- Footage with a item that necessities evacuating

Changing the Weather

Numerous creations just advances or proceeds at the impulse of the climate. By and large, in the event that we have a movie maker who's justified regardless of his or her salt they will plan the shoot so it happens in the suitable area with pleasing climate. On the other hand, the climate can change on a dime. Fortunately the VFX craftsman can, much of the time, change the climate. Be that as it may, it's only one out of every odd case.

Requirements:

- Footage of the shot that needs its weather changed.
- Replacement footage for the sky. (if needed)

![Fig. 4.5 Turning an Overcast Day into a Sunny Day](Created by Author)
Removing an Actor from the Frame

It is a typical understanding among editors, like that of magicians, to demonstrate the group of viewers something required to converge their attention regarding one place with the goal that they will be diverted by something unique. Sometimes we may have a great shot that will be the best regardless of differences in the position of things. Here's is a suggestion of managing that, concealing the confusion.

**Requirements:-**

- Footage of the shot that requires a new or innovative focal point.
- Footage or still photo that may be utilized to mask or hide something.

**Horror effects**

Some folks love to view movies of horror. There are few who are
habituated to go for sleep after watching a horror movie. There are numerous reasons why they adore ghastliness. The reasons vary in various individuals. There are however the impacts of watching frightfulness. A few people discover horror or frightfulness fascinating and enjoyable to view. Others would not set out watch films or even short clippings of this kind.

One reason why individuals appreciate watching ghastliness is the story. As the story line of many horror movie is fascinating. The thrills and suspense in the horror movies influence the viewers to watch more movies like the same. These horror movies needs great standards of direction. The horror movies director are mindful so as to pick the best strategies utilized by the on-screen characters in making the frightful or horror films more appealing. The role or acting done in the film is additionally appreciated by most of the audience. The fearlessness delineated by a few characters in these stories inspire the majority of the audience. Other individuals appreciate watching horror movies in light of the thrilling component in the motion pictures and movies. The music that is incorporated into the movies and horror films flicks additionally persuades a few audience to continue viewing the films. So all these features of horror movies make such movies or motion pictures intriguing for the individuals who cherish viewing the subject horror

Evil Eyes
Fig. 4.11 Creation of evil eyes
A convention of the horror movie is Twisting the recognizable soothing face into a beast. Here we will take a performer and give him a quite irritating change. The eyes of a human is a standout amongst the most particular highlights of a person has and a little change in this marks a distinction and we could say that they have been changed into a beast.

**Requirements:-**

- Footage of a performing artist whose eyes we will supplant.
- Large resolution still photograph of one of the performing artist's eyes, ideally a digital macro lens close-up

**Zombie Faces**
Till now you have gone through the tutorials to make someone beautiful or look attractive using a Photoshop. Now let’s see how to make a face look absolutely frightening or terrific.

Requirements:-

- A shot of the performing artist whose face will get our beast make-up.

Digital Dismemberment
At some point or another, in most great slasher flicks, somebody lost an appendage. Here's an approach to subtract an arm, finger, or leg with a little cautious arranging and some VFX enchantment..

**Action effects**

As per the historical background, activity motion images have inferred two things: extensive blasts and more noteworthy spending designs. These motion pictures are frequently called as "idealistic" or "popcorn" yet the activity type is furthermore very well picturized and shown in the world of cinema. In the present action film, the VFX skilled worker is routinely required to finish two critical things: save money on expensive objects, hard to-get shots and extra stand-ins from the distinctive dangers of on-set failures.

In the 1930s, most movement films were expected for period pieces, with a similar number of sword fights as the present action films rely upon gun duels. By the 1970s, the tide had swung to the cruel and tumble, not bewildered of bowing the law cop flick. In any case, the 1980s gave us the Stallone/Schwarzenegger/Willis-style of over-the-principle one man against widespread trap of mental oppressor's style that helped impact the action to film the common style in Hollywood today. By the mid-1990s, another move twisted up evidently self-evident, the effect of the Hong Kong style of action film, which joined the class with awesome "kung-fu" sort. To the dissident fresh motion picture maker, it has been a serious class in view of its prerequisite for swollen
spending designs.

The best in class official normally can't stand to detonate automobiles, squash windows, affect Uzis, and have swarms of winged animals (affirm, that one we can hold just for John Woo). Since the mid-1990s, it has ended up being progressively standard for movement films to VFX over certified impacts and traps to shield movies from going course finished spending design. Look at it thusly; there aren't over and over again that you can detonate a set, should something turn out seriously. Low-spending action films, for instance, Robert Rodriguez's El Mariachi, show that with great keenness, and the instrument set, it's positively attainable. Moreover, with some VFX charm, spending designs can be saved and structures can regardless be detonated. We should encounter various typical action film shots and how, with some extremely low-fi VFX frameworks, a film can at introduce come in under spending design.

Vehicle Explosions
Creating vehicle explosions

(Created by Author)

There is a little piece of every one of us that gets some sort of fulfillment about observing something detonate. Exploding something, while at the same time adding much energy to a film, can likewise kill a financial plan. Frequently a visual impact of a blast can be a bit of frustrating, so here are a few hints on the most proficient method to influence it to feel to some degree persuading. Here's one strategy to make an extraordinary looking blast.

**Ingredients:-**

- Footage of the vehicle you would like to blow up (shot with the camera on a tripod).

- Footage of the background or location where the vehicle will blow up without the vehicle there.

- Stock footage of Square Flames from www.detonationFilms.com

**Building Fire**

![Building Fire Image]
Creating building fire

(Created by Author)

If we somehow managed to influence a best 10 to rundown of the most widely recognized inquiries from scholars about After
Effects, "How would I make fire?" would be a contender for the main spot. In all seriousness, it bodes well; we favor that students are more enthusiastic to learn so they should produce fire on a PC than attempt to make genuine ones.

Requirements:

- A master shot of the exterior of a building with windows (we are going to add the fire and smoke)

Creating Realistic Gunplay
Aside from a good gunshot sound effect, you will also need a great looking “muzzle flash” to give your chase scene a great sense of shoot them-up gunplay.

**Requirements:**

- Footage of our actor firing our prop gun.
- Prop gun (Try spray painting a water gun black).
Stock shot of “muzzle flashes” (the one in use here comes courtesy of www.detonationfilms.com, a great resource for free and lowcost special effects stock footage)

Unit summary

This unit gave a brief introduction to VFX and its relevance in today’s world. It discussed about digital composting and computer generated imagery CGI. It also introduced the software’s used to create VFX and elaborated various tools associated with VFX. It explained the process to create different effects like an action shot, a horror shot, changing weather, creating explosion, etc.

Assignment

1. What is digital composting?
2. What are computer generated imagery?
3. What are blue screen and green screen, why are they used in VFX?
4. What is story boarding?
5. What are the advantages of using VFX?
6. Why is VFX used instead of video shooting?

Resources