

# JOB ROLE – ROTO ARTIST

Sector – Media and Entertainment Sector

(Qualification Pack Code: MES/Q3504)

( Class-XI )

विद्यया ऽ मृतमश्नुते



एन सी व्ही आर टी  
NCVET

PSS Central Institute of Vocational Education  
Shyamla Hills, Bhopal – 462 013 , Madhya Pradesh, India

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# **UNIT 3: ROTOSCOPING BASICS**

## **Chapter 9. VFX Techniques and Rotoscoping Terminologies**

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# Chapter Objectives

The students will be able to:

- ❑ Describe basic VFX techniques and equipment which included Blue and Green screen, Motion Control, Encoda Cam and Motion Capture,
- ❑ Define major Rotoscoping terminologies.

# Introduction

Visual effects work took place primarily in **post-production phase** although its planning is part of **pre-production phase**. Visual effects is the general category of special effects or special visual effects.

Visual effects have been an integrated part of filmmaker's toolbox since from prehistoric era of cinema. It was **1890s**, when first time cinematographer simply cranked a handle on a wooden camera.

The first ever known visual effect was created in 1895 in a short film called '**The Execution of Mary, Queen of Scots**'.

# Basic VFX Techniques and Equipment

## Blue and Green Screen

The most common used technology in VFX world is **traveling matte photography** also known as blue and green screens or **Chroma keying**. Both blue and green screen cloths available in various shades. The best one between them are known as **Digital Blue, Digital Green**, and **for television** Digital Video Blue.

The standard cloth screen can be replaced with some other types of materials.

- ❑ Specially prepared **green or blue paint** material, which can be used to paint floors and walls. It is better to **paint** complete wall rather than taking the cloth screen on rent. These paints are also expensive so use it carefully.

# Basic VFX Techniques and Equipment

## Blue and Green Screen

- **Mirrorplex** is a hard, silvery, highly reflective plastic material that functions like a mirror. It can be placed on floor or hang it as a ceiling piece to reflect normal blue or green screen. It is useful to show full length walking of the actor on the floor. In such case colour of painted floor will be changed by the stage lighting. Hence mirrorplex reflects the pure colour of background.

# Basic VFX Techniques and Equipment

## Blue and Green Screen

- ❑ Similar to Mirrorplex, a material called **RoscoflexM** (#3801) and **LEE Mirror silver** (#271) can be used. They come in **4 by 25 feet rolls** and can be adhered to a smooth surface with a clear adhesive.
- ❑ **Blue or green leotards, gloves, and hoods to cover puppeteers or other people** who must be in frame but need to be matted from the shot at the end. It is less costly to remove a green-suited puppeteer from a scene than to rotoscope out a normally clothed person.



# Basic VFX Techniques and Equipment

## Motion Control

It requires a (i) camera, (ii) motorized head, (iii) crane or dolly for camera movement, (iv) computer to control and operate whole system. In motion control system, any part of this system including the camera shutter and focus can be controlled by a stepper motor. This motor is controlled by a computer program specially written for this purpose.



*Fig. Real-time Motion Control System*

# Basic VFX Techniques and Equipment

## Use of Motion Control

Some situations where motion control system plays an important role are:

- ❑ In **double role shots**. When an actor appears two times in the same scene while camera is moving.
- ❑ In **dangerous scene, elements and location**. For example, in a shot where an actor is interacting with dangerous animal, or being surrounded by an explosion.
- ❑ To **match shots of live action with miniatures and models**. It is also useful in shot which needs scaling with either very small people or giants to when camera is in motion.

# Basic VFX Techniques and Equipment

## Uses of Motion Control

- ❑ To shoot **clean plate**. It is a kind of **blank frame** before the action occurs on the same. It is helpful in **removing wires, special rigs of an actor**.
- ❑ In **Table Top Photography**. It is used in commercial shooting, where camera and product need to move in definite relation with each other. This action repeats in multiple passes.
- ❑ In **Crowd enhancement**. It is not popular now, because of the development in creating computer graphics people, it can be used to **multiply a relative small group of people in huge crowd** by using same action again and again.

# Basic VFX Techniques and Equipment

## Uses of Motion Control

- ❑ **Multiple Animals.** Use motion control system to achieve the appearance, that multiple animals of different species acted together in same shot like Babe: Pig in the City (1998).
- ❑ **Stop Motion Animation,** means creating animation by exposing action frame by frame. One of application of motion control technique is to create motion.
- ❑ **To replace large portion of background.** For example in movie **Hollow man (2000)**, every scene with the invisible man had to have a background pass to allow the compositors to fill in the background.

# Basic VFX Techniques and Equipment

## Encoda Cam

It is a **real time pre-visualization system**. It is a production tool which makes possible to **record actor in real time** on blue or green screen set and combine this live performance with previously made background. This background can be a set extension, 3D CGI characters, and 3D animation



*Encoda-Cam system from documentary  
'Space Odyssey'*

# Basic VFX Techniques and Equipment

## Uses of Encoda Cam

This Encoda Cam system uses same standard **production crane, dollies and camera heads** that crew are used to work. This system has several advantages:

- ❑ It gives an idea to the Director, VFX supervisor and actor **to judge how adequately the digital background works** with the action or character.
- ❑ It is also helpful for camera operator, which allows him to **know the camera moves** with respect to background.

# Basic VFX Techniques and Equipment

## Motion Capture

Motion capture is generally known as **mocap**. It allows the VFX artist to **record and capture** the movements of performer's body, limbs and facial expressions. It is recorded digitally in the form of data points that get recorded and translated by a computer.



*Fig. Motion Capture*

In this process the movements of the performer is captured by a **number of special cameras**. These movements are detected with the help of special marker attached to the performer.

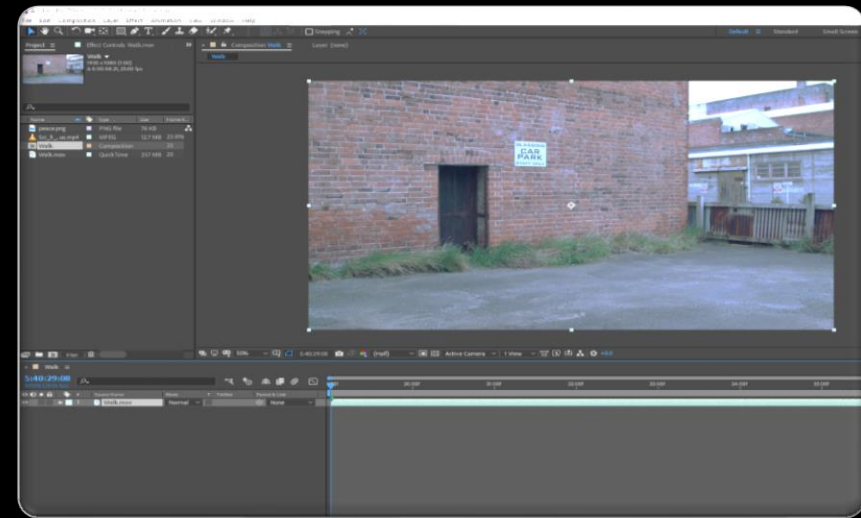


# Major Rotoscopy Terminologies

## Composition

This is a general term, used to explain a Roto artist's work area which includes the **timeline, viewing area, and layering and effects windows**. In short anything that is part of interface of any visual effects software program.

Generally it is applied to Roto artists, compositors, sometimes called compers, and motion graphic designers.



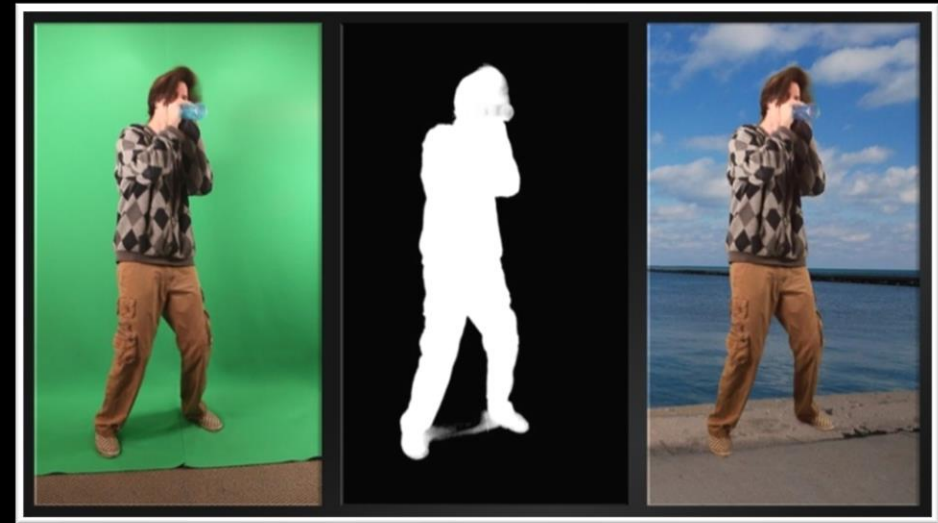
*Fig. Composition in After Effects*



# Major Rotoscopy Terminologies

## Matte

A **black & white frame** or set of frames that tells the program what is visible and what is not. The **white** color region is **visible** and denoted by color ID 1, **black** color region is **not visible** and denoted by color ID 0. **Gray areas** or **mid tone** region are visible in which intensity depends on their numerical position between 1 and 0.

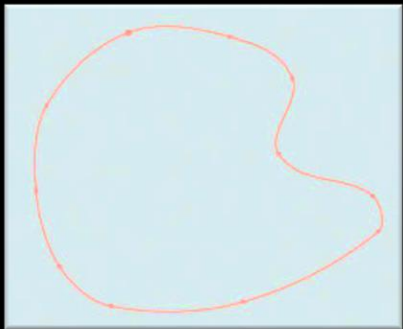


*Fig. Matte*

# Major Rotoscopy Terminologies

## Control Points

It is also called, **Simple points**. Basically, these are a series of points that defines the **position**. These points are created by the users, determine the **curve of the spline**. These points are basically divided in two categories.



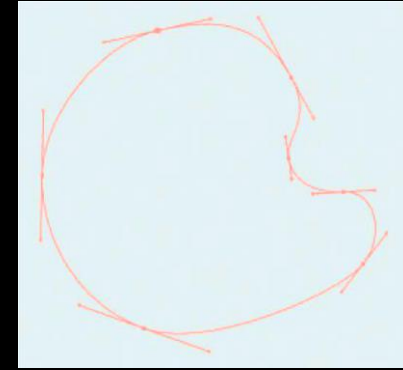
*Fig. Non handled Point*

**Non-handled Points.** This type of spline gives user a very limited control. It does not allow to change the angle of the incoming or outgoing curve, without moving the position of the point itself or its surrounding points. this sort of point/spline is called **Roto-Bezier**.

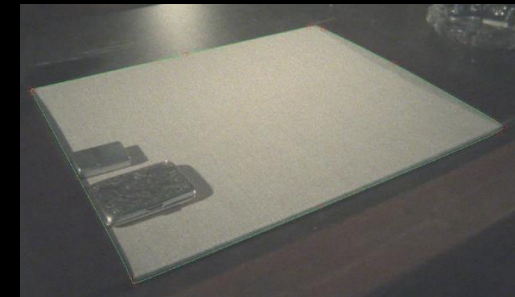
# Major Rotoscopy Terminologies

**Handled Points.** This type of point has **tangent handles** that allows increasing or decreasing the angle of the curve through the **set point**.

**Spline.** It is a set or group of points that is connected by a line made up of **curves**, The spline can be animated either from the **individual points** or **the object as a whole**. There are different kinds of splines and each program label it differently based the type of point used to create it.



*Fig. Handled Point*



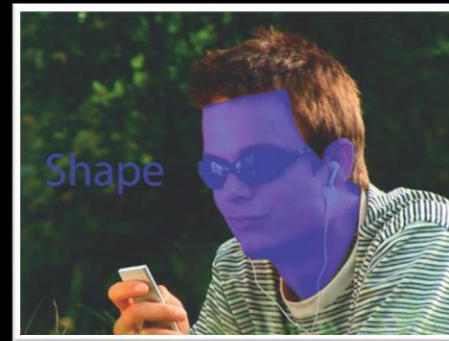
*Fig. Spline*

# Major Rotoscopy Terminologies

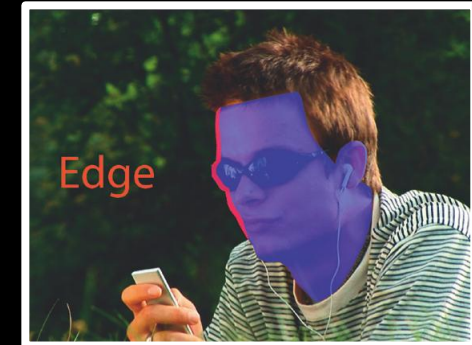
**Shape.** A closed spline refers to the spline as a whole, not only the individual points.

**Edge.** This is the outside of the shape and, the most important aspect of rotoscoping.

**Motion path.** This is the route/path taken by object on the screen. For a roto, this path should be strictly defined within the X and Y.



*Fig. Shape*



*Fig. Edge*



*Fig. Motion path*

# Major Rotoscopy Terminologies

**Key frame.** In timeline, user can set a specific value of the object in each frame by using key frames. During Roto, most of times you need to set **position** and **opacity** in particular frames using keyframes.

**Focus Object.** It is an object to be isolated from the frame or creating a **matte**. For example, it can be any person or a specific part like left arm or legs, even any particular object within frame like lamp-post.

# Major Rotoscopy Terminologies

**Tracking.** It is the process of creating position, rotation and/or scale. It transforms key-frames based on a scenario or an element in the footage. Tracking can be used to apply on resulting key-frames to a spline or set of splines. It can also be used to stabilization of any footage containing jitter. There are two types of tracking:

**Point Tracking:** Generate key frames based on a single user-defined point within the footage.

**Planar Tracking:** Generate key frames by tracking a number of points and treating them as though they were all on the same plane.

# Major Rotoscopy Terminologies

**Alpha Channel:** It is technically known as black & white matte. It can be embedded in certain file types such as Targa, TIFF, DPX and many more. Most compositing software break down the image into RGBA channels. That is acronyms for red, green, blue and alpha.

## Frame Range

It is the length of required number of frames. It is used for whole length of the shot or even a specified smaller portion.

## Interpolation

Process by which, the computer creates position or visibility keys between user-defined key frames.



# Major Rotoscopy Terminologies

**Keying** : A process by which, sections of the footage are removed by singling out a visual constant. Mattes are created based on the hue or luminance of the image. This technique is largely used when footage is shot on green screen. But, it can also be used in conjunction with roto. When a shot is “keyed,” the computer remove the area of the shot that are similar in color or brightness while keeping the unlike areas visible.



*Fig. Chroma key technique*



*Fig. Matte after keying*



# Major Rotoscopy Terminologies

## Object Mode

While working in this mode, a Roto artist manipulates the shape as a whole, without altering individual points of the spline. It is suggested to work in this mode as much as possible.

## Sub-Object Mode

This mode gives access to the individual points along the spline. It is suggested to manipulate splines in this mode as little as possible. However in some situations, it cannot be avoided.

## Summary

In this chapter you have learnt about the basic visual effects techniques and equipment such as blue and green screen, motion control, encoda cam, motion capture. Further, you have been able to define major rotoscoping terminologies like composition, matte, control point and many more.

**Project Coordinator : Dr. Dipak D. Shudhalwar**

**Assistance**

**Mr. Abhinaw Kumar Dwivedi**

**Mr. Shanil Kumar**



**Joint Director**

**PSS Central Institute of Vocational Education  
Shyamla Hills, Bhopal – 462013 , Madhya Pradesh, India**

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**E-mail: [jdpsscive@gmail.com](mailto:jdpsscive@gmail.com)**

**Tel. +91 755 2660691, 2704100, 2660391, 2660564**

**Fax +91 755 2660481**

**Website: [www.psscive.ac.in](http://www.psscive.ac.in)**