



## **FOSSEE Summer Fellowship 2020**

On

**Graphics and Animation using Blender 2.8**

Submitted by

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**(IIT Roorkee, Civil engg, 3<sup>rd</sup> year )**

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# Acknowledgement-

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He supported me and give me comfort when my great grandmother passed away. Because of sir I came to know about so many new things I am really thankful to them. I have to appreciate the guidance given by other supervisor as well as the panels especially in our project presentation that has improved our presentation skills thanks to their comments and advice.

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# Chapter1:- Introduction

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## **1.Objective -**

The objective of this fellowship is to create a 3d model that resembles the actual objects. This 3d models can be used in creating educational videos so that students can get the idea that how the objects actually looks. Creating the library of 3d models and from that models creating a short animation movie is our main goal in this fellowship.

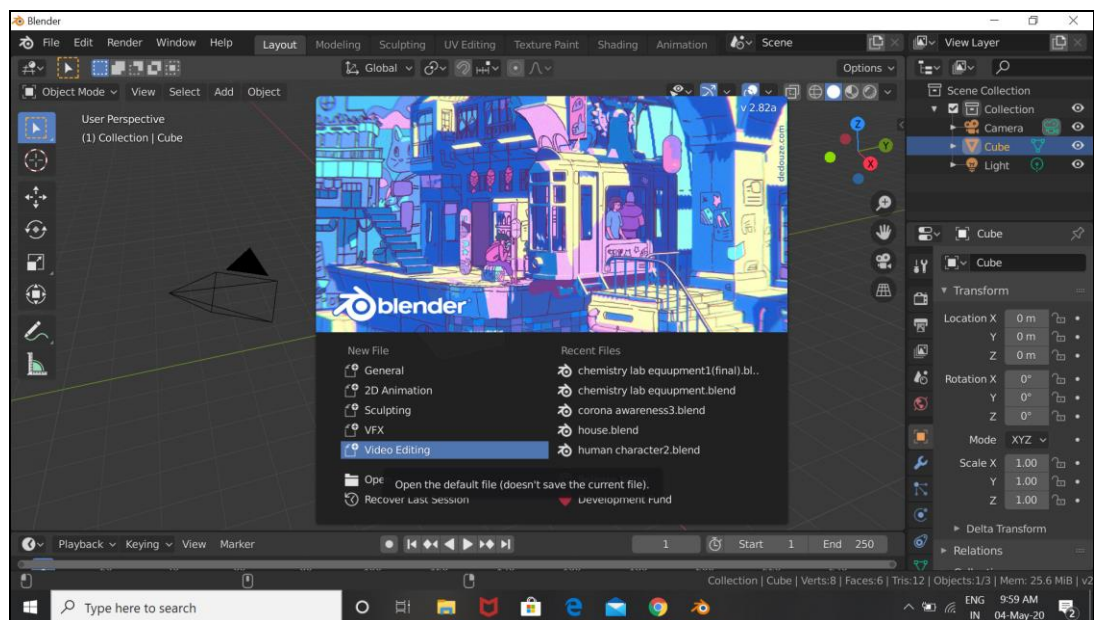
Also for the process of creating video and models I extensively used Blender which is free software. So our side goal is to introduce the blender to the peoples who are eager to learn 3d.And get them started by providing them with 3d models, 3d environments.

## **2.Blender-**

Blender is a free and open-source 3D computer graphics software toolset used for creating animated films, visual effects, art, 3D printed models, interactive 3D applications and video games. Blender's features include 3D modeling, UV unwrapping, texturing, raster graphics editing, rigging and skinning, fluid and smoke simulation, particle simulation, soft body simulation, sculpting, animating, match moving, rendering, motion graphics, video editing and compositing.

On January 1, 1998, Blender was released publicly online as SGI freeware. In May 2002, Roosendaal started the non-profit Blender Foundation, with the first goal to find a way to continue developing and promoting Blender as a community-based open-source project.

For this project I was using Blender 2.82 version. I used Eevee for the rendering process.



# Chapter2:- Project Workflow

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## 1)Finding story ideas-

For creating movie we need to have a nice story which contains nice morale and good twist. For animation movies 'animation' is always a second thing the primary thing is the story which is soul of movie.

Idea for our story is on creating corona virus awareness.

After fixing that we will focus on corona virus awareness. I used Restriction method to further develop my story.

### **Restrictions:-**

- 1) I will include only 2 main characters. The characters will not move their lips and as face animation is tough.
- 2) The character will have some difference between them. In this case 1 character is careless and on the other character 2<sup>nd</sup> character is cautious.
- 3) The environmental settings will be basic. And I will use HDRIs for the natural background lighting.

After that I came up idea about grandfather and his grandchild. And the story will be that grand child is careless and because of him grandfather suffers from corona. And at the end he learns his lesson.

## 2)Turning idea into the words ( script) -

Transferring your thoughts into paper is one **of the hardest steps** in the movie making process.

Script writing, sometimes called Screenwriting, involves creating an outline of all of the events taking place in an animation. This means detailing all of the audio such as dialogue, sound effects and music score. It also details all of the visual events or features appearing or taking place throughout such as fades, transitions from one scene to another, characters appearing, descriptions of the landscape etc.

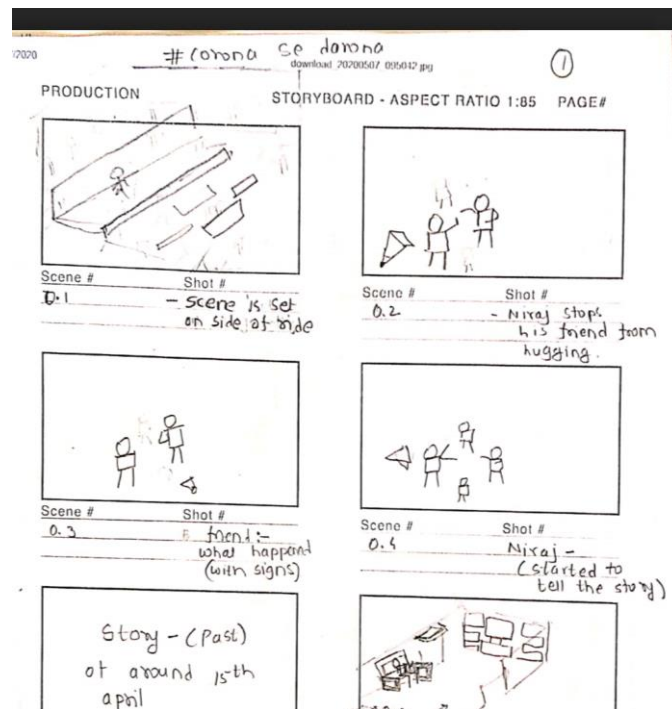
Scenario 1	
Visual cue	Narration
<b>Scene (1)</b>	
Hall, <b>Niraj</b> sitting on the sofa, phone vibrates. He picks up the phone.He stands up. And move towards the door ( camera side view)	Around 15th april I was sitting in the hall watching tv, my mobile was on charging. Suddenly I got a call from my friend to turn up and I was ready to walk off from the house to meet with a friend
<b>Suraj</b> stops him. ( camera from front )	At that moment , my grandpa stopped me and said..
Conversation between <b>suraj</b> and <b>niraj</b> (Camera focusing on both)	
<b>Suraj</b> (camera on both)	don't go son. The whole world is in lockdown. You shouldn't go outside.
<b>Niraj</b> (camera on both)	I will come back just after meeting him. It won't take long.
<b>Suraj</b> (Camera on suraj)	But son...

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### 3) Story Boarding-

A storyboard is a series of drawings meant for pre-visualizing the shots of a movie. It is an essential tool for the director to get a sense of the way the movie is going to look and feel.

The Storyboard saves time on set. Since the camera angles were determined beforehand, the DP (director of photography) knows exactly what is expected of her during the shoot. For producing storyboard I used hand drawing as it is effectively time saver.





## 4) 3d Modeling and rigging

**4.1) Creating characters-** I created two characters which are totally animation ready with facial rig available. To create 3d characters I took a course on YouTube called 'cartoon character modeling series' from 'Thilaknathan studios'.

Creating character is tedious. It contains following steps-

- a) Creating base mesh – We create a base mesh from reference images.
- b) Sculpting – in this we add details on our base mesh. Creating a smooth sculpted character is really important.
- c) Retopologize- we need to retopogize the sculpted character. As sculpted character have too many faces and too many irregularities. Retopology reduces total faces of mesh. In my character I have around 3 lac faces and in my character around 1 lac regular faces.
- d) Rigging- I used rigify add-on in blender. Rigify add-on can create a total rigged armature for our character. And it is really helpful.
- e) Unwrapping character- unwrapping is really important. After unwrapping the character we can add textures on character and it will look really good.

- f) Texturing and shading whole character body- in this process we paint whole body and shade it so that it looks real.
- g) Creating clothes for character- After painting character we need to create clothes and also add textures on them.
- h) Adding hairs- After adding clothes we create hair, eyebrows, and mustaches using hair system.

**4.2) Creating other models-** I created more 3d model packs which includes-

- Mobile charger, mobile (Motorola g5s +), charger pin, Socket.
- Car, traffic light, road
- Mask, sanitizer, wash basin, mirror
- House, Sofa set, 2 chairs, TV, fence
- Ventilator, clock, bed, pillow
- Chemical lab equipment ( 10 models)

**4.3) Environment-** For background I used HDRI from Hdriheaven.com. This provides free textures and HDRIs.





## 5) Animating-

Animation include moving the objects and armature (bones) to different frame and adding key frame to make it animate from one place to another. To make it move then using graphs and nodes to adjust the speed and distance of the animation.

### 5.1) Key framing-

This is the conventional method of animation which involves saving the rotation, location and scale information of the object to be animated, at particular frames.

For character animating process I used **pose to pose method** and **straight ahead method**.

## 6) Camera –

After animating the character and models we need to adjust the camera such that we follow the 12 principles of animation. One of the principles is that the main character where we want to focus should always be at the middle. And if we want to show the interaction between 2 characters then the camera should be placed at midpoint of the character.

For animating the position of camera I used **camera switching technique**.

## 7) Rendering process-

After rechecking the whole animation we can now render the animation. For rendering process I used sheep it the online platform where we can render our animation. I rendered the file in eevee not in cycles. Because eevee is a faster rendering engine.

Also I divided my whole movie in 7 parts for faster rendering process.

## 8) Video editing-

The rendering process gives us as output, each frame of the animation as a **.png** image. A four minute, 12 fps animation video has around 3000 frames. These frames are then loaded into blender's very own Video Sequence Editor (VSE). The frames are arranged in

accordance with the script and the storyboard. This step is only to make sure that all the frames conform to the script as well as the storyboard. Any improvisation pertaining to visual appeal is also made at this stage of the workflow process.

In this process I added all 7 different rendered video files to video sequence editor create a complete animation video. Also added some little effects in video so that video will look a lot smoother.

## **9) Test screen-**

Once the final sequence of the animation video is obtained, the frames are converted into an AVI file. It is then viewed using a mobile phone and a laptop to ensure that every scene has the intended effect and visual appeal that we had in mind during the ideation phase. Changes of any kind are not tolerated or accommodated after this phase and therefore any non-conformity to the storyboard or script is thoroughly identified and removed in this phase.

## **10) Audio editing-**

This is the final editing which you do where you synchronize your dialogue and sound effects with the animation. Then the viewer will get the complete visual and audio effect which will create that feeling of watching something magical.

For enhancing the dialogues I used audacity which is free sound editing software and for the sound effects I used freesound.org website.

## Chapter 3:- Story description-

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### **Corona se mat darona**

Story revolves around simple concept that we need to be more cautious and should not take the corona virus lightly.

Our Story starts with in the present where corona virus is depleted drastically. Our main character Niraj is on walking on footpath he met his friend there and he refuses to hug him and on asking why he starts to tell his story.

In past where corona patients are increasing but there are not many patients in Niraj's locality. He suddenly got the call from his friend. He decided to visit his friend. But his grandfather refuses to let him go .But niraj does not listened and visited the place anyway.

He drove car to his friend's house. Spent some time there and returns to his house. On returning home Niraj's grandfather asks to wash his hands. But Niraj refuses to do that .Stating that he doesn't need to that as there are not much patients in his locality.

After some days they faced some health issues. And on doing some test they found out that both were corona positive. They were hospitalized for 2 weeks.

On returning home niraj was drawn in sorrow. Because of him his grandfather had to suffer so much. With deep affection he ask that what is the problem. Niraj with guilt ask for the forgiveness to his deeds. Grandfather asked that where he went wrong .On that note he told that he didn't listened to him and he his sorry for that.

Grandfather told that the biggest mistake was his mindset. Because of his mindset he didn't follow precautions. Niraj realizes his mistake, He gave promise to the grandfather that he will be cautious.

Now we again move to the present. Now he is more cautious. He also did online awareness campaigning by telling his story and creating awareness.

***Morale of the story-***

**At the end of the day, the goals are simple:**

**Safety and**

**Security**



## Chapter4:-

### Issue faced and their Solution:-

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During fellowship I faced many problems but prof. khushal were always there to support me and provided me the solutions that will work effectively.

- 1. Issue in creating a tutorial video:** - At the beginning of fellowship our aim was to create the models and also create a short tutorial video for the models. But the created videos were turned out to be very fast paced so we had to drop that plan.
- 2. Issue in character creation:** - Creating character is really tough process. And I had no prior knowledge in the character creation. So I had to take the course on YouTube. To learn the character creation
- 3. Issue in animating the character:** - Animating the character is a tough task. For animating character there around 1600 variables. So for learning the animation I had to take the course on udemy to learn the animation.
- 4. Issues regarding rendering:** - for rendering the animation video I decided to go with Eevee engine. For rendering process it takes around 1 minute in rendering so for

rendering around 3000 frames it will take 50 hours.so for rendering I used sheepit online rendering platform

# Chapter 5:-

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## Reference-

- Wikipedia
- YouTube:- Thilaknathan studios  
(<https://youtu.be/I90mqEL8dFU>)
- Udemy – course on Character animation with blender for beginners

## Software used:-

- Blender 2.82
- Audacity
- Obs studio
- Microsoft word

## Open source websites:-

- Hdriheaven.com
- Freesound.org
- Sheepit.com

**Thank you**