

2016

Summer Internship Project



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Declaration

I hereby declare that this report represents the work done by me as my summer internship project and is completely in my own words. The original resources to the images which are used at some points have been referred so.

I also declare that this report does not contain anything which violates copyrights. I have included all the part of my work during internship, with proper permission of the authorities in the respected studio.

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Signature:

Name: Umesh D Wagh

Roll No: 156340007

Date: 27/6/2017

Abstract

The Summer Internship Project was mainly focussed on learning the animation process involved in creating proper animation content for a live project and then implementing the acquired skills for the actual creation of the animation content.

I have performed this project under HopMotion Studios, Andheri East, Mumbai. The main purpose of this project was to experience and learn the workflow as well as management processes that are followed at a professional studio and to contribute to the ongoing projects at the studio.

The purpose of the project has been clearly solved and workflow as well as management processes have been fully understood. Actual experience of working on a live project fulfilled the purpose more effectively.

This report sums up the learning experience from the workflow and animation style at the HopMotion Studios during this one month internship period.

Acknowledgements

First of all, I thank IDC and my Professors for providing me such a wonderful opportunity to perform internship project at my place of interest.

I thank HopMotion Studios for providing me such a great learning experience in the whole animation workflow and management processes that are followed at the studio. I would like to thank Mr. Neel Lukkani, the Chief Operating Officer and founding member of HopMotion Studios, for his valuable guidance and for giving us opportunity to work on such interesting projects.

I would also like to thank all my colleagues and artists at HopMotion studios for helping us time to time, giving us knowledge about the major work flow of the studio and also for including us as a member of the HopMotion family so soon.

Certificate of Completion



4th June 2016

TO WHOM IT MAY CONCERN

This is to certify that Umesh Wagh, pursuing Masters in Design in Animation from Industrial Design Centre(IDC), IIT Bombay has completed the internship at HopMotion Animation Private Limited from 2nd May, 2016 to 30th May, 2016.

We found him sincere, hardworking, technically sound and result oriented. He worked well as part of a team during his tenure.

We wish him every success in life.

Anish Patel
Director
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Introduction

The project started with the introduction and study of already ongoing work in the studio which helped me understanding the work culture and the animation style of the studio.

It then lead to understanding the tools or the softwares which are being used in the studio. We were given some basic exercises in order to get hands on the software, mainly Toon Boom Harmony.

During 1st phase (first 15 days) of our internship period we studied and tried the basic tools at each stage and in the 2nd phase, we worked for some of the shots in the live projects. After basic training by the project leads, we were exposed to the animation process which they follow. Some tasks at each of the stages in the animation process were assigned to us in order to understand each stage clearly.

We also got to know about the management and business processes followed by the studio through regular meetings with the leads.

1. Work Culture and The Style of Hop Motion Studios

Like every organization the Hop Motion studio also follows certain work culture. During 1st week of the internship tenure our main task was to understand the style and the work culture of the studio.

For that, we were exposed to the already done and ongoing work of the studio.

It included mainly following things:

1.1 TV series

Hop motion studios produces some very nice TV series and web series like Chhoti Anandi, Meet Ninja Patel, KungFuSingh etc. We studied the scripts, storyboards, animatics and some actual episodes of the series “Chhoti Anandi”.

While doing that we studied some shots at each stage of the process, which helped us in understanding the style and the work culture of the studio very fast.

1.2 Preproduction

We also studied the preproduction work of the ongoing projects. At this stage we were also given some already rigged characters (in Toon Boom Harmony) to

study. During this we got to know more about the style they follow as well as the work pipeline they execute for the preproduction.



Image 1 – Hop Motion Studio’s TV series “Chhoti Anandi”

1.3 2D Animation

Hop Motion Studios is a full service 2D animation studio, uses mainly Toon Boom Animation software.

During the whole tenure of our internship we worked at every stage of their animation pipeline and skilled in major tools which are used in there.

We were introduced to each team in the studio who guided us time to time during our work.

2. Animation Process

Like every other Animation Studios, Hop motion studio follows similar kind of animation process.

We were given basic information about each stage of the process by management head of the studio, Mr. Neel Lukkani.

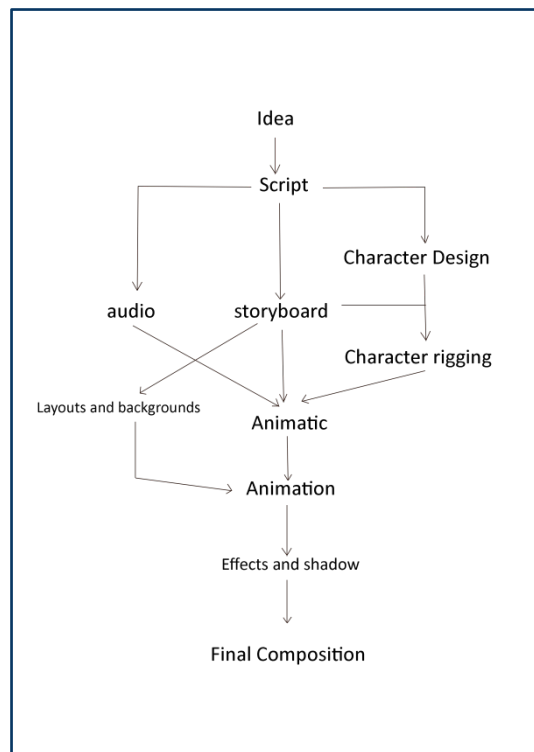


Image 2 – Animation process

As in image2, the animation consists of following stages:

- **Idea**

Hop Motion studio owns many projects as mentioned earlier. These projects are outcome of their own ideas. After lot of the team discussions, they finalise the story for the idea.

As it is a small studio, they also work on outsourced projects and web series. For such projects they are handed over with the story and scripts in order to proceed to storyboarding and animation.

- **Script**

The studio has its own script writing team for many of the in-house projects. And sometimes they take help from outside writers based on the story ideas.

Among the projects that we studied “Chhoti Anandi” and “Modern Activity” were in Hindi. Both of these projects were scripted very well considering the local languages and local audience.

- **Character Design**

In order to set the proper mood and animate activities of the character perfectly, this stage is very important. With perfect character design, on the first

impression itself audience connects to its character very easily and even small activities and features make the character very live.

For in-house projects like “Chhoti Anandi”, all the characters are designed within the studio and all of them are very convincing and proper to the script and location in the story.

- **Storyboard**

All major decisions about setting the shots, camera positions, angles, etc. are made at this stage and hence it is an iterative process too.

At Hop motion studios, a separate storyboarding team takes care of the storyboarding of different projects. And for that they mainly use Toon Boom Storyboard Pro.

Depending on the camera positions, the shots are mainly divided into the categories as: Close-up shots, mid shots and extreme angle shots.

In order to maintain balance the complexity as well as ease of animation, and also keeping in mind the importance of the angle decided for the shot, percentage of these shots is maintained approximately as:

- Close-up shots : 5-10 %
- Mid shots : 60-65 %

- Extreme shots : 5 %

This classification of the shots also sets the proper mood needed for the respective scene.

- **Audio**

After script falls in hand, audio team starts working on the audio for the animation. Dialogues are recorded outside the main studio with the help of professional sound designers and voice artists.

Audio is set for the particular scene before the animation in order to set proper timing for the shots and also for lip-synching.

- **Layouts and Background**

The Hop motion studio has a proper team for layouts and backgrounds. For in-house projects, layouts are not done separately, but the same team of background artists creates backgrounds in major projects.

They also use 3D rendered backgrounds sometimes. The tools they mainly use for layouts and backgrounds are Adobe Photoshop and Toon Boom Storyboard Pro.

The studio follows some steps while creating backgrounds as:

➤ **Napkin Sketch:**

It consists of basic freehand drawings in order to understand key features in the background with no details.

➤ **Rough Sketch:**

It consists of clearer sketch than napkin sketch, with entire location without any particular angles.

➤ **Key Location:**

The main location decided based on the respective scene.

➤ **Key Background:**

The detailed drawings of the key location.

➤ **Scene wise Backgrounds:**

Sections of the main background are cut and set according to the respective scene

For international projects they get the samples for styling and also colour palettes decided by the respective clients. The style they use for local projects are very appealing to the location and perfect according to the script needs.

- **Animatic**

Storyboarding and Animatic are the main decision making and iterative processes. At the studio, final animatics are created very near to the

final animation which reduces much work for animators. The timings and camera views are finalised at this stage.

- **Character Rigging and props**

After character designs are finalised, some team members starts rigging the characters. For this they have maintained proper hierarchy of the body parts, according to the animation needs.

They create rigged turnaround of each character if needed along with eye blinking for each pose, and also basic mouth movements (phonics) are created.

Toon Boom Harmony is used for all this and then library files are created which can be imported for different scenes according the poses of the characters.

Simultaneously, props are created in layers according to their use by characters and angles which are needed.

- **Staging and Animation**

With animatic and rigged character libraries ready in hand, animators import all this to Toon Boom Harmony stage and start animating shot by shot.

The shots are divided among the animators according to their skills in particular type of shots. For Example, Some members are good at lip-synching so they do it for all shots. This helps in doing quality and quantity work in lesser amount of time.

- **Effects and Shadows**

After main animation is done, then only effects like smoke, rain, fire, dust, etc. are added. Shadowing is also done at the end only, which will avoid extra rework.

For this also, generally same group of members do this work for each shot.

- **Final Composition**

After all the stages and shot wise animation is done, then audio and videos are composed together and final editing is performed. After combining all the footages and adding credits, titles, audios, final film or shorts are rendered.

3. Management Tips by Head

The management head of Hop Motion Studios Mr. Neel Lukkani interacted with us time to time and introduced us to the whole animation process and production pipeline followed at Hop Motion studios.

While informing us about production management he gave us many basic tips which are very helpful while managing such big and small projects and whole team members.

- Find out your teams' strengths and weaknesses
- Understand your team

For Example, Some team members are good at lip-syncing while some are good at adding shadows, then divide the work accordingly.

- Estimate amount of work your team can produce everyday
- No. of Scenes = no. of backgrounds
Hence, keep in mind how many no. of backgrounds the bg team can create every day.
- NO shot should be LESS THAN 4 seconds
- Always consider man power less than what actually is!
- Always consider timeline more than you think.
- Always keep buffer time.

- Be aware of your team
Keep track of amount of work each member can do, and keep deadlines according to that.
- Calculate no. of seconds per week, no. of seconds per day, no. of seconds per person and hence No. of persons required
- Don't take out of reach work if you don't have capacity to deliver.
- Keep balance between Work and Fun



Fun and Work balance

4. Toon Boom Harmony

Almost all the animation at HopMotion studios is done using Toon Boom Harmony software, which makes the animation style and workflow of the studio different than traditional 2D animation.

The style they have got is very nice and fluid with this amazing tool.

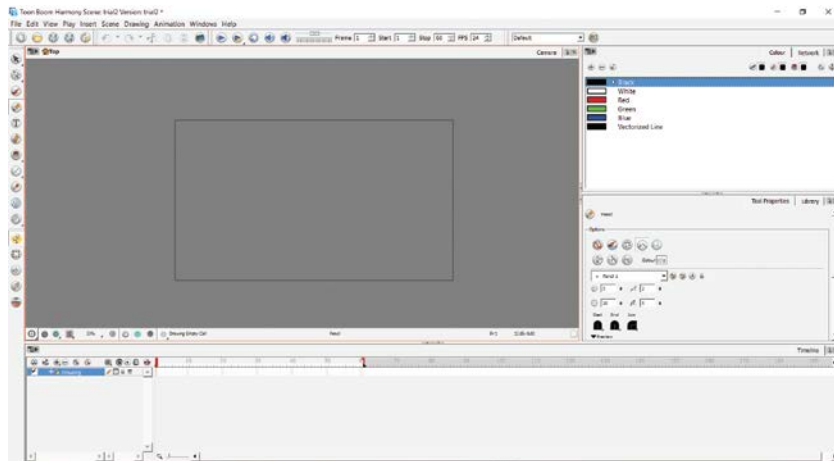


Image 3 – Toon Boom Harmony software basic stage view

4.1 Basic drawing and Pegs

Our first task after first week was to get hands on experience with the tools of Toon Boom Harmony. We tried basic drawing s first by which we got to know about different tools

for drawing in Toon Boom, like pencil, brush, fill color, selection tools, shapes etc.

During this period I tried some very basic sketches as in image 4 and 5.



Image 4,5 – basic drawings in Toon Boom Harmony



I felt the tools and interface of Toon Boom Harmony very nice and enjoyed drawing on it for quite a lot time after getting the tool.

After that we were given some basic exercises of animation in order to know basic tools for animation.

For Example, bouncing ball using drawings and using pegs, pendulum follow through, stick figures with basic rigging, lifting heavy stone, drinking water, etc.

After all these exercises we got skilled with one very important feature in Toon Boom Harmony, which is Pegs. Using pegs, all the animation can be done. Each drawing layer can multiple pegs and under any peg there can be multiple drawings.

4.2 Character Rigging

After basic exercises, we were taught complete character rigging and were assigned characters from HopMotions webseries “Modern Activity”.

In this, a proper hierarchy is maintained between different body parts, in order to animate the characters properly and easily.

The example can be taken of basic rigging of hand and hierarchy for the hand is:

Fingers -> palm -> forearm -> Upper arm -> shoulder

Likewise, I completely rigged side view of the main character from web series “Modern Activity”, named Savio. (Image 6)

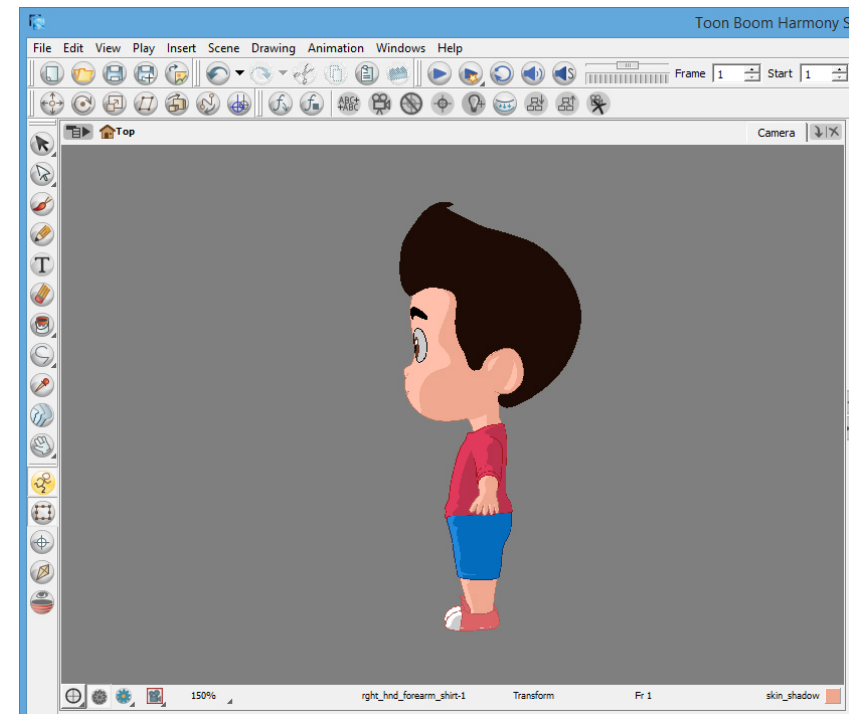


Image 9 – character ‘Savio’ rigged completely by me for a web series

This character was a less complex character but still rigging all the parts was quite time taking task.

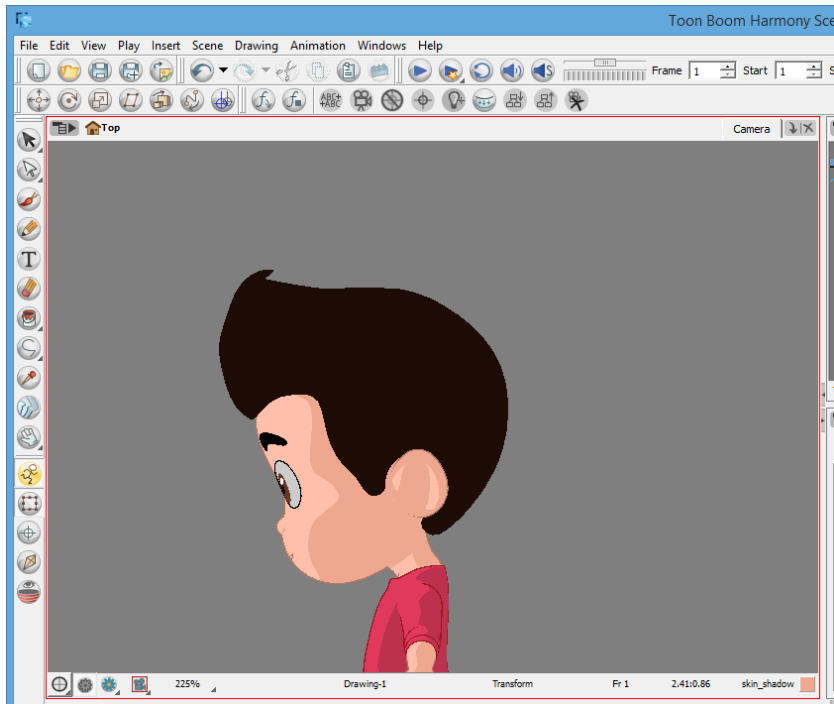


Image 7 – neck joint of rigged character

Image 7 and 8 shows the movement of rigged character at the neck joint.

It can be seen in these images that how proper layering and rigging makes it easy to animate the character.

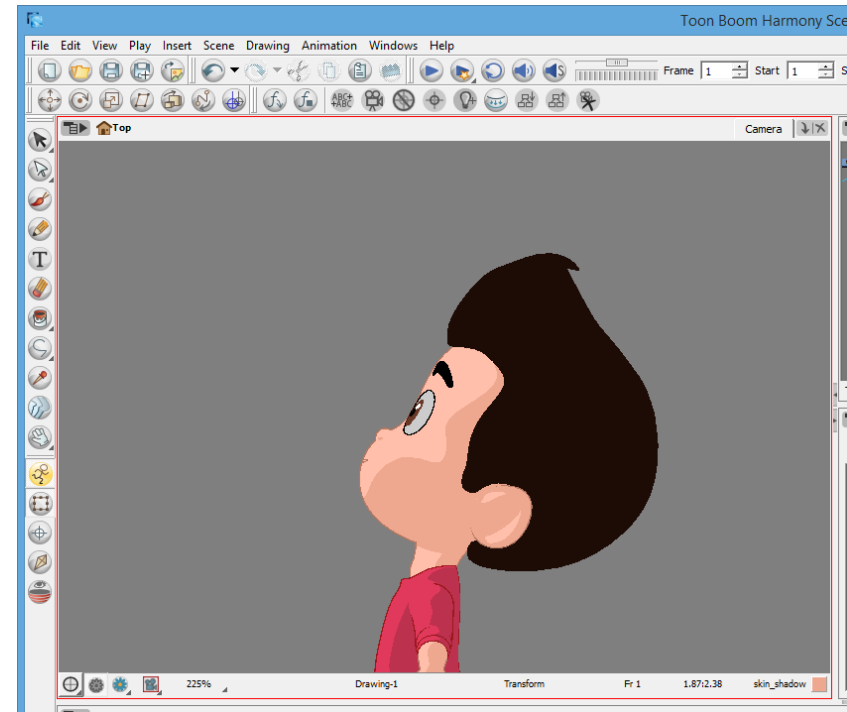


Image 8 – neck joint of rigged character

4.3 Network View

Toon Boom Harmony has this very nice tool called network view. This tool shows the whole rigging in network form. Image 9 shows the complete network for rigged character 'Savio'.

The tool is very helpful for changing the hierarchy of the parts of the rigged character very easily.

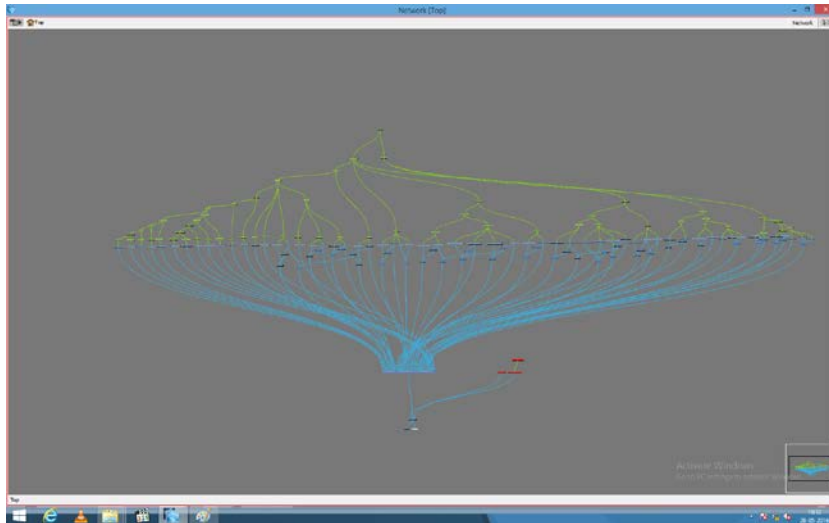


Image 9 – Network view for character 'Savio' rigged by me

Whereas Image 10 shows the zoomed-in view of the network view for the hierarchy of parts of head.

It can be clearly seen how complex is the hierarchy for just parts of head.

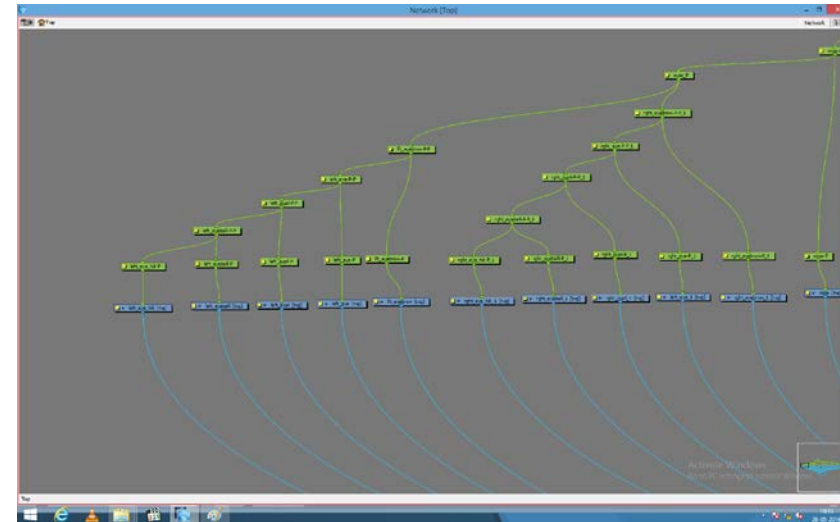


Image10 – Network view showing hierarchy of parts of head

4.4 Layering within a drawing layer

One more very nice feature Toon Boom Harmony has is layering within the drawing layer.

It consists of four parts as: Overlay layer, line art layer, color art layer, underlay layer.

This feature is also very helpful in making fluid movements at joints and also for shadowing using more tools in module library which we will see further in this chapter.

4.5 Module library

There are more tools for making the rigged character's animation fluid and without any mistake at joints. These are module library tools, in which main tools are autopatch and cutter tool.

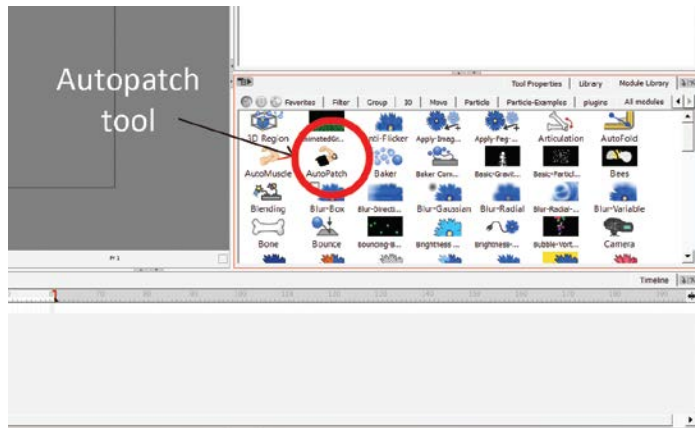


Image 11- autopatch tool in module library

Autopatch tool takes input from colour art of the respective drawing layer and patch it onto the layer on which it is applied.

Image 12 shows how autopatch tool is used along with the cutter tool. In this, autopatch takes input from color art of layer “left-hand forearm” and gives it to cutter which is applied on layer “left- hand palm”.

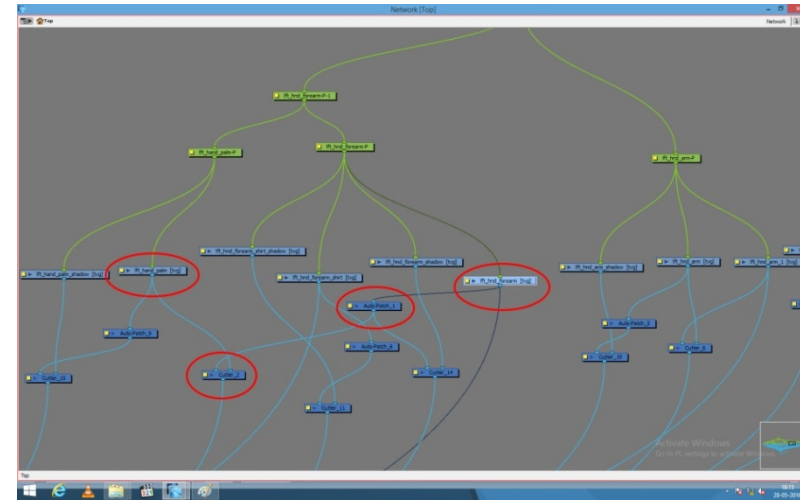


Image 12 – Use of autopatch and cutter tools

What happens here is after auto patching colour of left hand forearm onto left hand palm, it hides the joint line of left hand palm.

Image13 on next page shows the result of using autopatch and cutter tool.

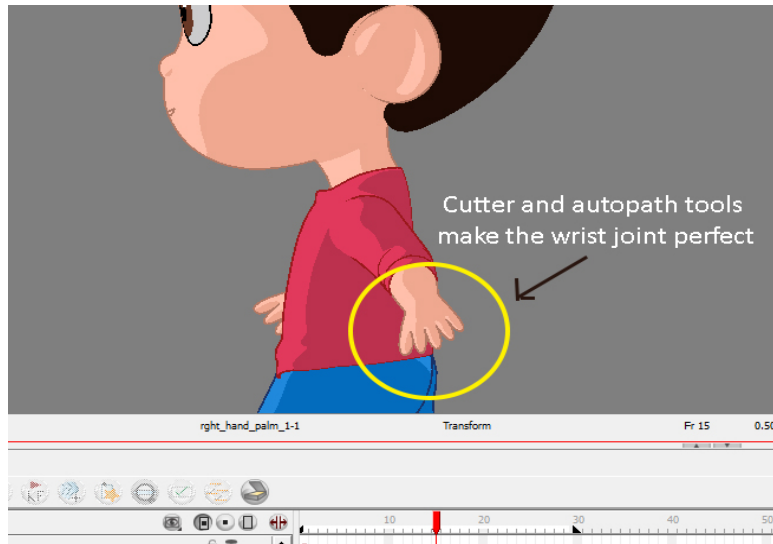


Image 13 – result of autopatch and cutter tool

4.6 Shadows

Shadows are added to each part of the character. The process used is similar to above autopatch and cutter tool.

We will see the process with an example, for character 'Savio' (side view) rigged by me, we will add shadow for his torso.

Image 14 shows the color art of torso layer before adding shadow. Now, one more layer is added for drawing shadow.

Image 15 shows added layer for shadow on top of torso.

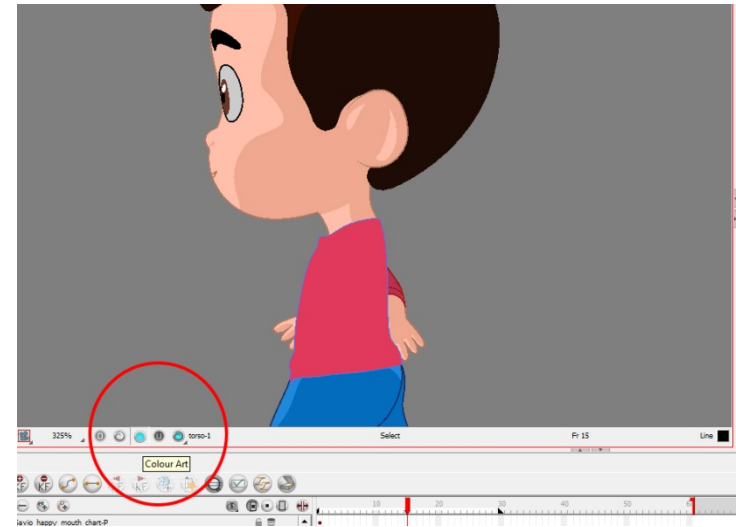


Image 14 – Savio's torso layer (color art) before adding shadow

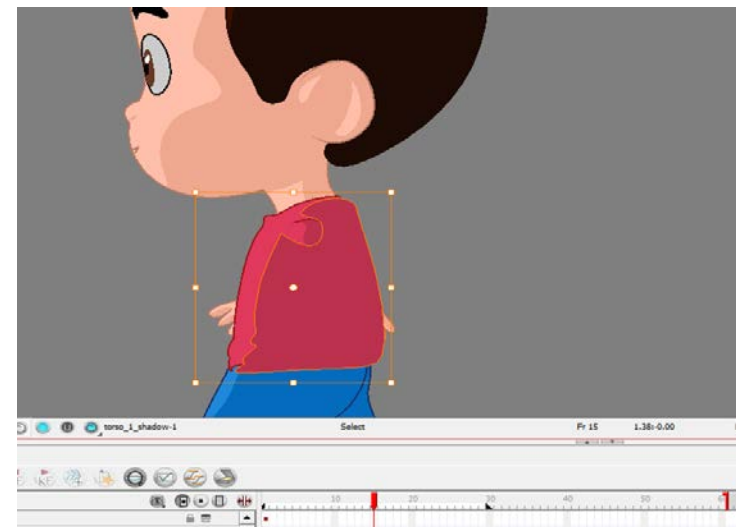


Image 15 – added layer for shadow drawing

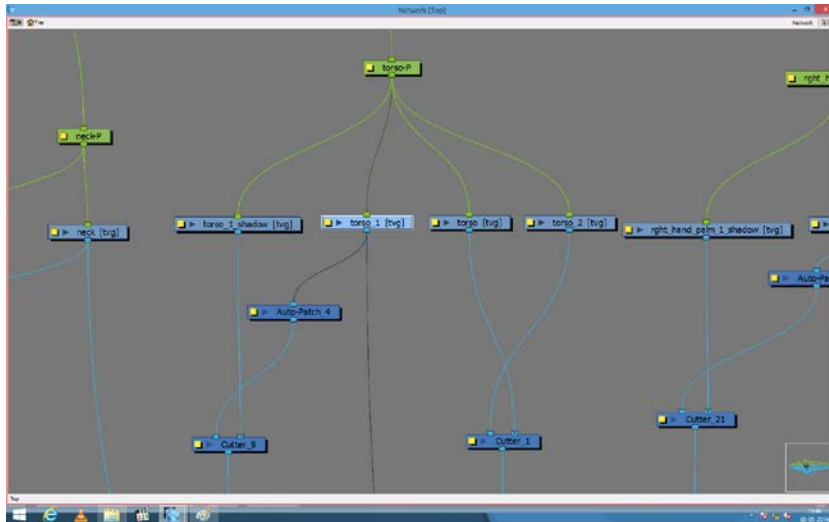


Image 16 – Autopatch and cutter on shadow layer for torso

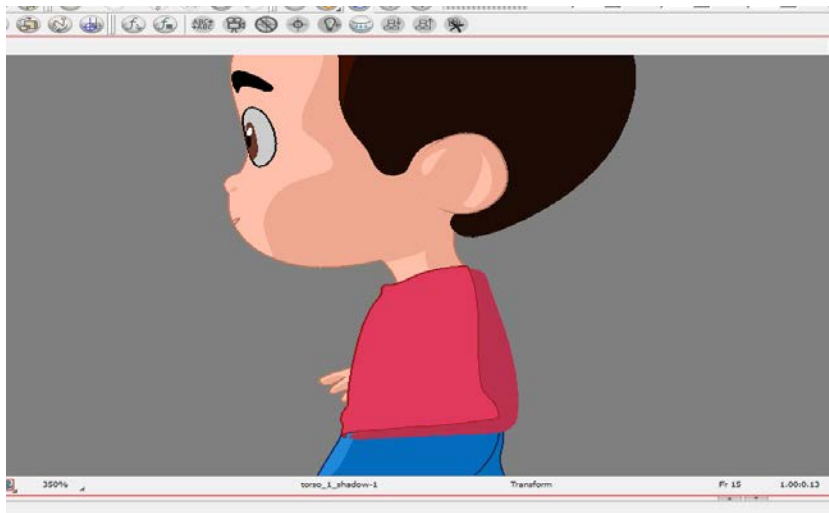


Image17 - result of autopatch and cutter on shadow

Image 16 shows that, using autopatch tool input is taken from colour art of layer “torso” and its output is given to the cutter which is applied on layer “torso_shadow”.

As in image 17, colour art in torso layer is patched on Shadow layer which hides that much part of it.

But this is not the required result.

For this, cutter tool is inverted as shown in image 18, which will cut the shadow from outside.

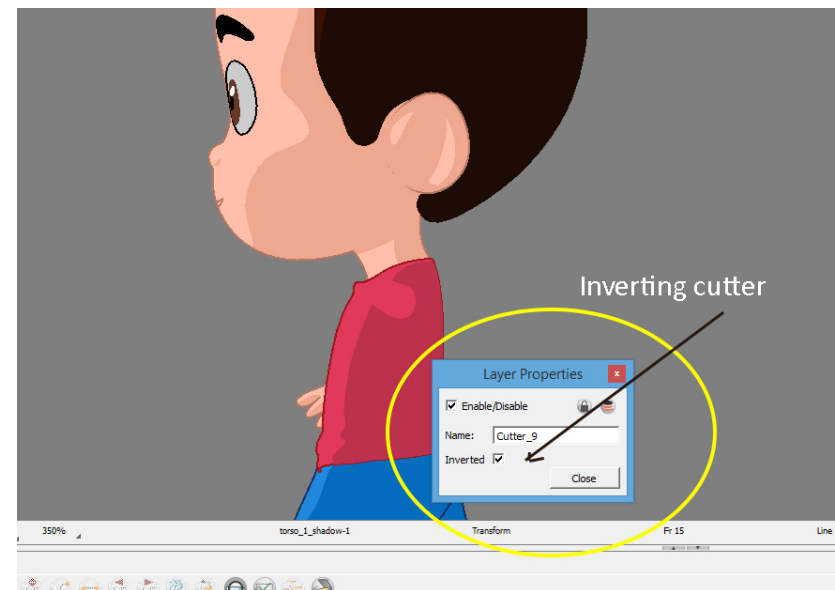


Image 18 – inverting cutter tool

And hence we get required result as shown in Image 19.

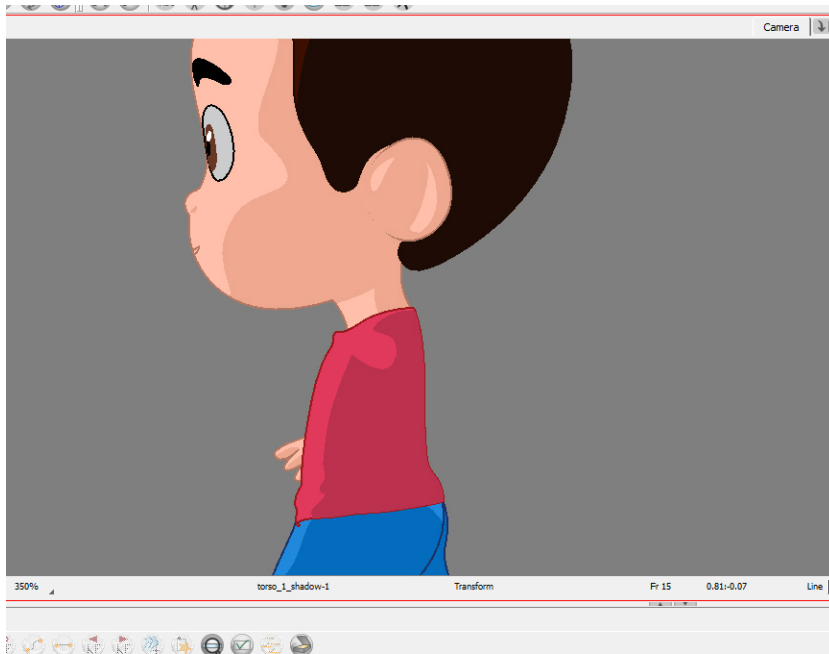


Image 19 – Required result 1

Further, image 20 shows the result after setting previously hidden left hand layer to visible. (It is on the top of torso layer)

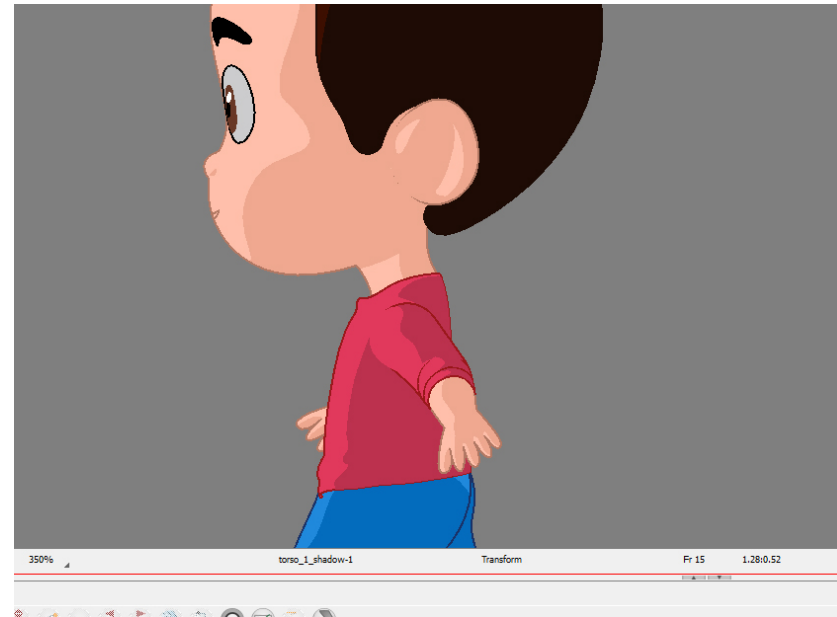


Image 20 – result after setting left hand visible

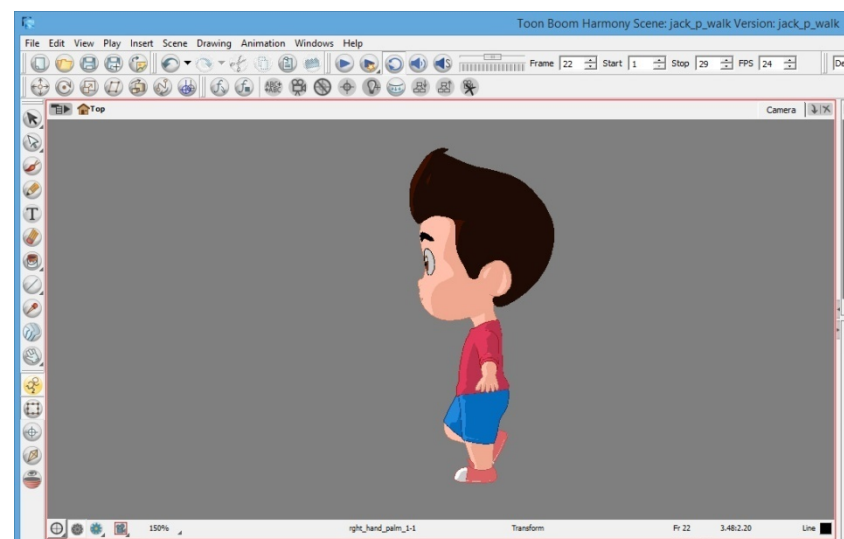
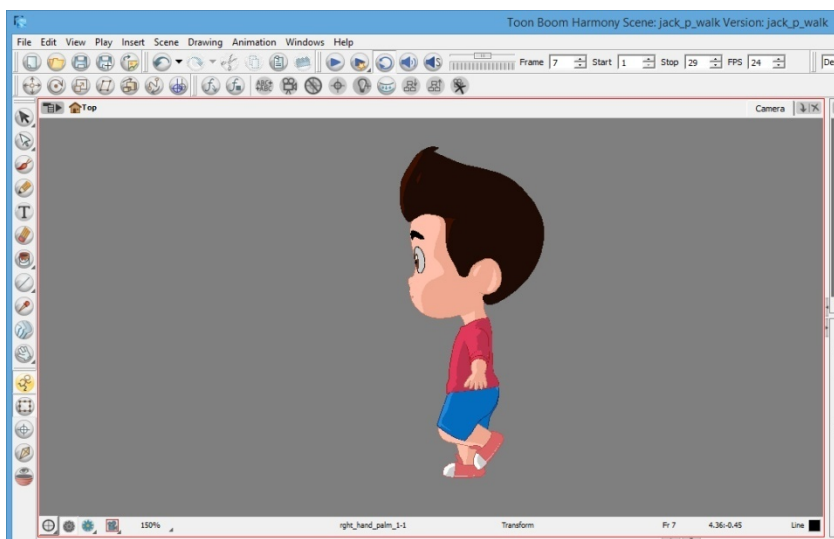
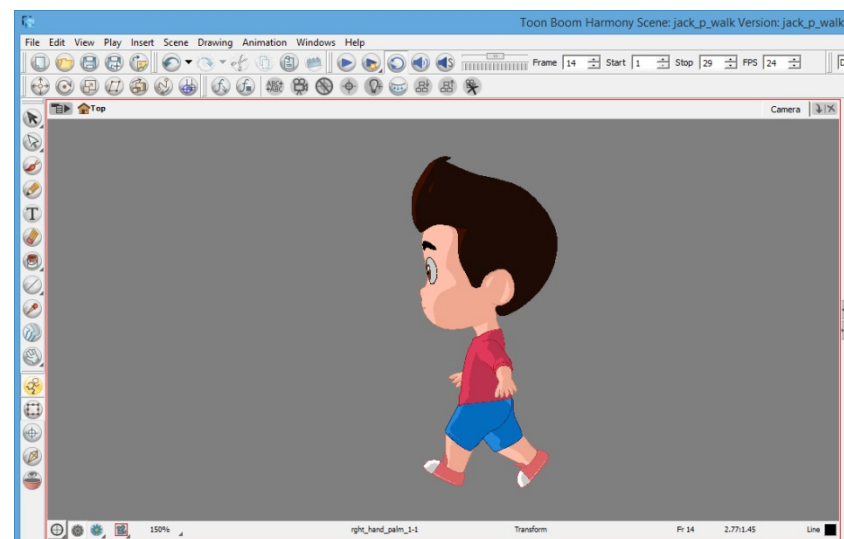
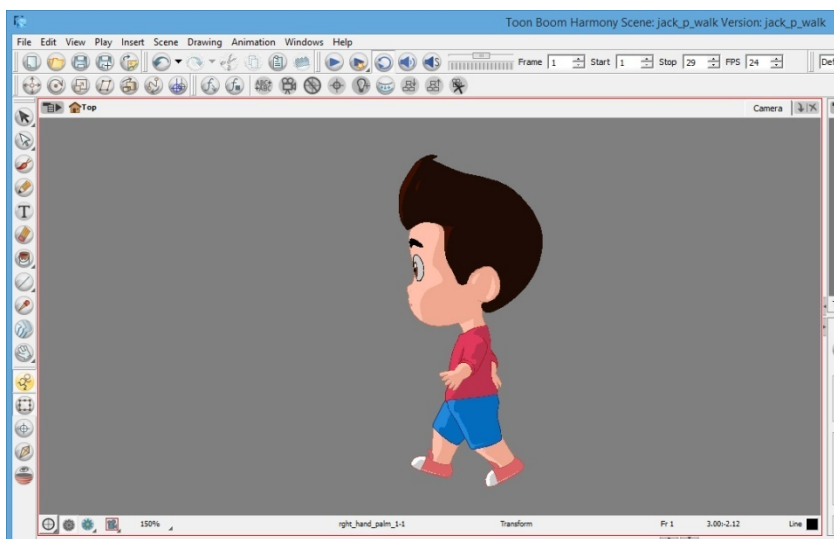
4.7 Animation

After character is rigged fully, it is saved as library, and imported while animating shot for that character.

Setting keys for animation is same as any other animation software.

Images 21 to 24 (next page) shows four keys set using rigged character “Savio” and after setting inbetweening on our basic walk cycle is ready.

Images 21 to 24 : 4 keys set using rigged character to get basic walk-cycle



4.8 Curve Editors

Like many other computer animation softwares, Toon Boom Harmony also has curve editor feature. It is called as “Set Ease for Multiple Characters”

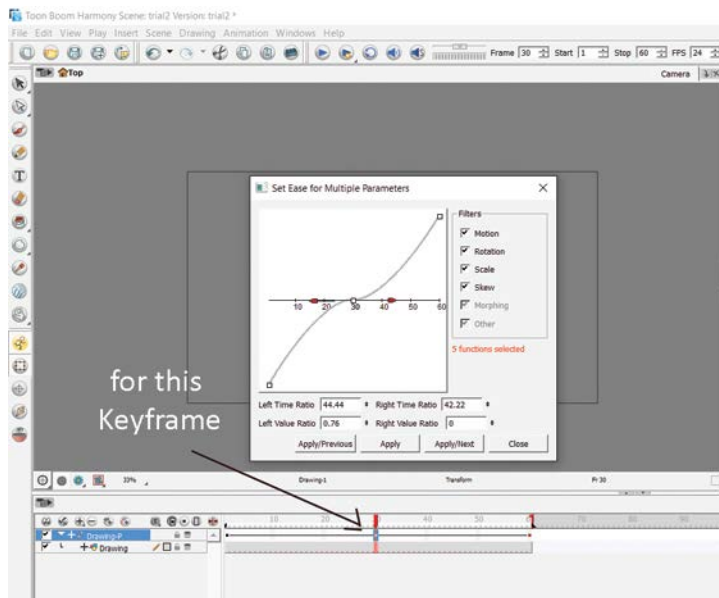


Image 25 – curve editor (set ease for multiple parameters)

Using curve editors this speed of animation can be varied using simply manipulating graphs in curve editor.

Image 25 shows a snapshot of curve editor in Toon Boom Harmony (Set Ease for multiple parameters.)

When any keyframe is set, by default in-betweening will be done with constant speed.

5. Production Management and Logging

The management head of the studio Mr. Neel gave us a brief lecture on how they manage the production at Hop motion studios.

As any other animation studio, Hop motion studios also keep the pipelined production process. The central database is maintained at a server machine and each artist works with this database. Each time when artist accesses the database using his user id, the files are copied locally onto his/her respective machine and then (s)he works on this file and saves as next version into the central database.

In this manner, parallel processing is achieved as well as versioning is maintained. Also artist's name gets attached to the file.

Along with this central database, in order to keep track of project, a proper logging is done every day. They maintain log sheets per episode, which is called production log sheet.

This sheet consists of shot wise details as shot no., duration of the shot, artist's name,

no. of frames which has been completed yet and comments regarding the shot.

The typical production sheet looks like:

Sr. No.	Shot No.	Duration	Artist	No. of frames	comments

The production sheet is really helpful in managing the whole pipeline of animation process. And maintaining and updating it daily certainly helps in keeping account of everyday's work, deadlines, remaining work and artist's individual records.

6. Props

After working on various tools in Toon Boom Harmony, we were given some props to make, which would be used for an international project by Hop Motion.

These Props included all the objects which will be used by characters or are included in secondary actions. It included things like trophy, window ventilator, laptops, cloths etc.

The lead member of the said project explained the process to be followed while working on props. He gave us idea of use of given props and how they are made with reference to given shot.

The sequence of steps and rules that we followed in order to create any prop (in Toon Boom Harmony), were as:

- We were given the respective storyboard image of the prop.
- A new drawing layer is added above the given image in Toon Boom Harmony.
- Then the prop is traced exactly on the line art layer of the drawing layer.

- Colour palette is made with picking colours in reference image and then whole prop is coloured as in the image.
- While creating any prop it is very important to first check how it is going to be used in animation and then dividing the prop in required parts in needed. Then each of these parts is drawn on different layers and is added under separate pegs in order to animate separately. Their pivot points were set accordingly.
- If any prop contain logo like images then such images were added according to the angle of the prop.
- After the prop is made completely it is saved in common database in which it will be pipelined for animation.

7. Shots in the live project

During the last week of our internship, we were given some shots to work on. These were from Hop Motion's project web series "Modern Activity".

Some of the shots were in process (at animation stage). For those shots we had to check for the fluidity of the animation that is already done and do the remaining animation.

The tasks also included checking technical mistakes in characters or props. For example, consistency of position of buttons on shirts, proper movement of joints, overlapping of different parts, blinking of eyes, hair movements, etc.

And for some of them, we had to add shadows. This work was quite time-consuming, as shadows had to be added separately for each part of the character. It is done with a proper sequence of steps as mentioned earlier.

As it was an ongoing project, we got to experience how all this animation pipeline process is actually executed. And also we got really nice tips from the head of the project and other employees who were working on this project.

The shots we worked on were then saved as newer version of those particular shots into the common database. And then they will be pipelined for further processes.

Working on these shots was really great experience and was really proper as our final task for this internship.

8. Interaction with other Artists

During the whole period of internship at Hop Motion studios, we got an opportunity to interact with many artists at the studio.

First of all, the management head of Hop Motion Studios Mr. Neel Lukkani had many interactions with us time to time. In the very first week he himself introduced us to the work culture and style at the studio. Later, time to time he assigned us to some other project heads. Mr. Neel gave us a brief knowledge about the whole pipelined animation process and many tips regarding production management as mentioned earlier.

Then we worked with a project head Mr. Nayadu, who also guided us about tools in Toon Boom Harmony and gave us some basic rigging assignments.

During second half of the internship we were assigned under another project head and main rigging artist Mr. Sudhakar. He gave us deeper training of rigging whole character according to the Hop Motion standards. He also walked us through creating props and also assigned us some of the props for live projects.

Towards the end of the third week, we interacted with background artist team, who told us about the different styles of backgrounds and different projects they are working for. They gave us demo of a sample background on Adobe Photoshop.

Beside this, during whole period we interacted with many animators doing different works

My experience at HopMotion

As I got to work for almost every stage of the animation workflow at HopMotion studios, the learning experience was very enriching.

During the whole period I got a lot of knowledge about the workflow as well as business and management processes that are followed at this studio.

I got the great opportunity to work on so interesting projects and with such an excellent team of various artists. The time to time guidance and interaction with all the colleagues and leads at the studio is very valuable to us.

The tasks assigned to us like character rigging, adding shadows, basic exercises, making props, maintaining production log sheet etc. made the learning experience so enriching and just GREAT !!

References

Logo image - www.hopmotion.com

Chhoti Anandi Poster - <http://hopmotion.com/our-work/>

Toon Boom - <http://docs.toonboom.com/help>