Videoverarbeitung– 188.346

Exercise 2 – Advanced Techniques in Video Editing

The goal of this exercise is to introduce you to advanced techniques in video editing. All of the exercises need to be solved by using a free program called **HitFilm**. The use of this program is **mandatory**. We hope that you enjoy solving the exercises ☺. Take a look at the finished videos on TUWEL to get an idea of how the results should or could look like. If something is not mentioned in the description you can do whatever you like, e.g., you can add other effects, change parameters, etc.

For each of the exercises and tasks, you need to hand in your:

- .hfp files (project files of HITFILM)
- .mp4 files (exported videos - your results)
- All other files used in your tasks (images, music, videos etc. otherwise we are not able to view your solution in HitFilm)

For this exercise, you also need to hand in **one**

- .txt/.doc/.pdf file (containing your discussion)

Compress all of the above files into a **.zip file** and upload it onto TUWEL until the respective deadline. **You need to solve the tasks by yourself!** If two or more submissions share suspicious similarities, each of you will lose at least 50% of the total points.

You can reach a total of **140 points** for this exercise:

- 63 points if you fulfill each task according to the instruction
- 63 points depending on how well and detailed the tasks are implemented
- 14 points for the discussion including your reflections upon your work

Download and Install HitFilm

https://fxhome.com/product/hitfilm

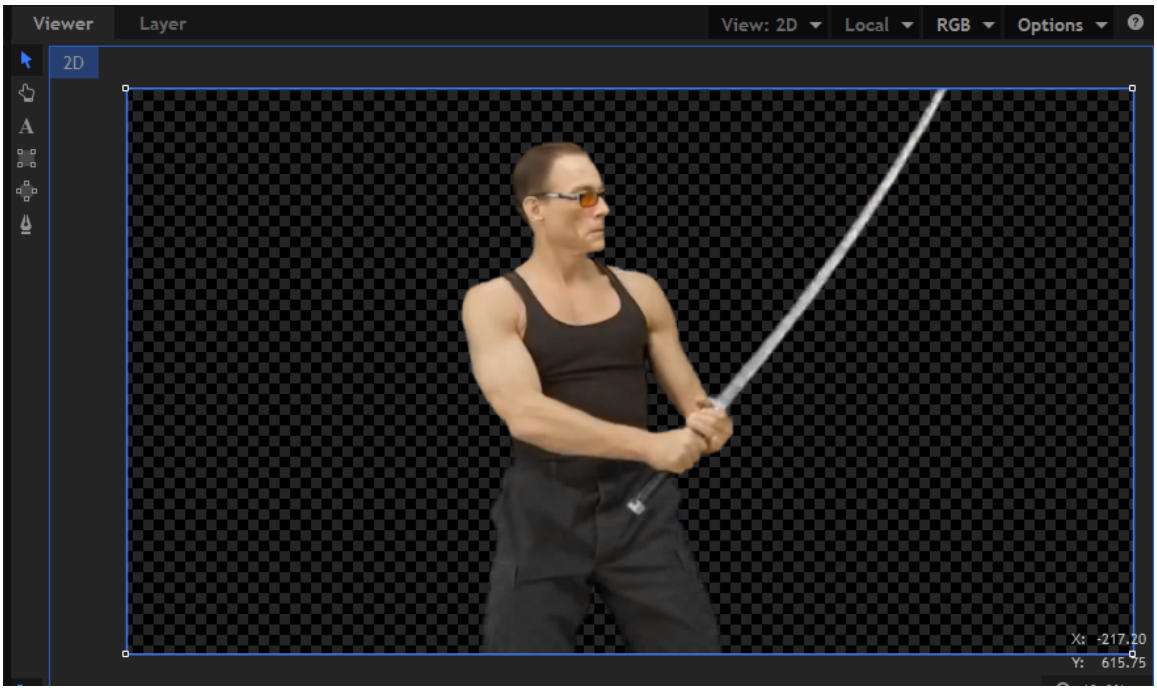
Click onto the Button “Download Free” and create an account. Follow the instructions on the page to download HitFilm for either Windows or Mac. When you open the program for the first time there will be a short introduction, you can skip this if you are already familiar with editing tools. Now you are ready to start with the exercise ☺.

Task 1 – Keying and Displacement (15 points)

In this task, we are going to edit a video that was taken in front of a green screen, key the person out, put him into another scenario (a forest in this case) and displace him to create an invisibility effect. You are going to need techniques (like keyframing) from the first exercise as well.

Steps for Task 1

- Import “Saber.mp4” and an image of your choice (I used an image of a forest).
- Make a composite shot of “Saber.mp4”.
- Use the “Color Difference Key” effect to isolate the actor.
- You will notice some unwanted green artifacts at the border. Add the “Spill Removal” effect to remove them.
- Now your video should look like this:



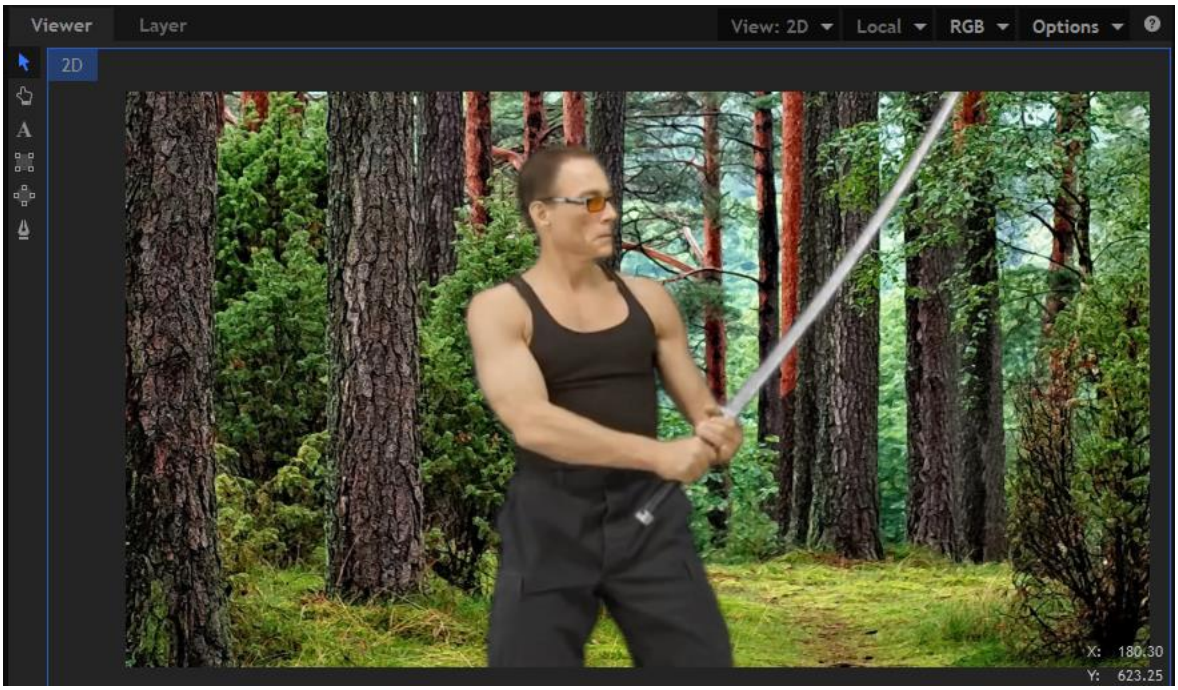
- Duplicate this layer.
- Call one of the two layers “Displacement Source”.
- Make a new composite shot of the “Displacement Source” layer and select “Move with Layer” instead of “Leave Here” when creating the composite shot.

- Add the “Blur” effect into the new composite shot. This will make the transition and the effect look smoother, afterward.

- Go back to the tab of your original composite shot from before.

- Make sure that the “Displacement Source” layer is beneath the other one.

- Drag in your background image into the composite shot as the lowest layer.



- Click onto the blue eyes of the two layers above the forest background (region 3). Now, only the forest should be visible.

- Add the “Displacement” effect to the background layer.

- Change the source layer to your “Displacement Source”.

- Change the “Horizontal Displacement” and the “Vertical Displacement” to Luminance.

- If you turn up the “Max Horizontal Displacement” and the “Max Vertical Displacement” you should see the silhouette of the actor appearing.

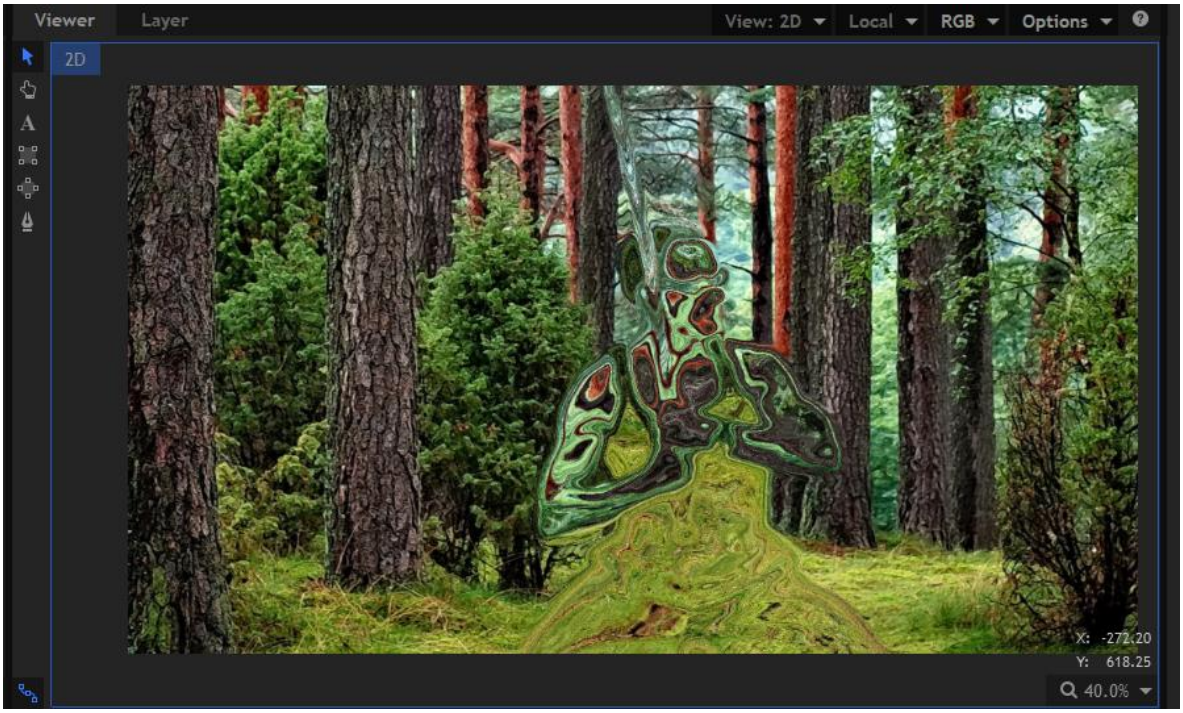
- Click on the two blue eyes again to see all the layers.

- Keyframe the opacity of the two layers showing the actor and the two max values for the displacement. In the beginning, the actor should be completely visible and after

the displacement completely invisible. After 1 or 2 seconds make a smooth transition via keyframing of the above-mentioned attributes.

- Feel free to change parameters as you like.

- The displaced version of the actor should look similar to this:



Discussion

- Discuss your results! Describe differences to the solution in TUWEL! What do you like about your result and what could be improved? (Only hand in one file for all discussions of this exercise!)

Task 2 – Feature/Edge Detection and Hologram Effect (20 points)

In this task, we are going to detect edges of a rotating earth and include it into footage and make it look like a hologram.

Steps for Task 2

- Import “Earth.mp4” and “Vader.mp4”.

- Create a composite shot of “Vader.mp4”, name it “Main” and create another composite shot and name it “Hologram”.

- Go to the “Hologram” composite shot.

- Drag in “Earth.mp4”.

- Use the “Color Difference Key” again to isolate the globe.

- Add the “Blur” effect.

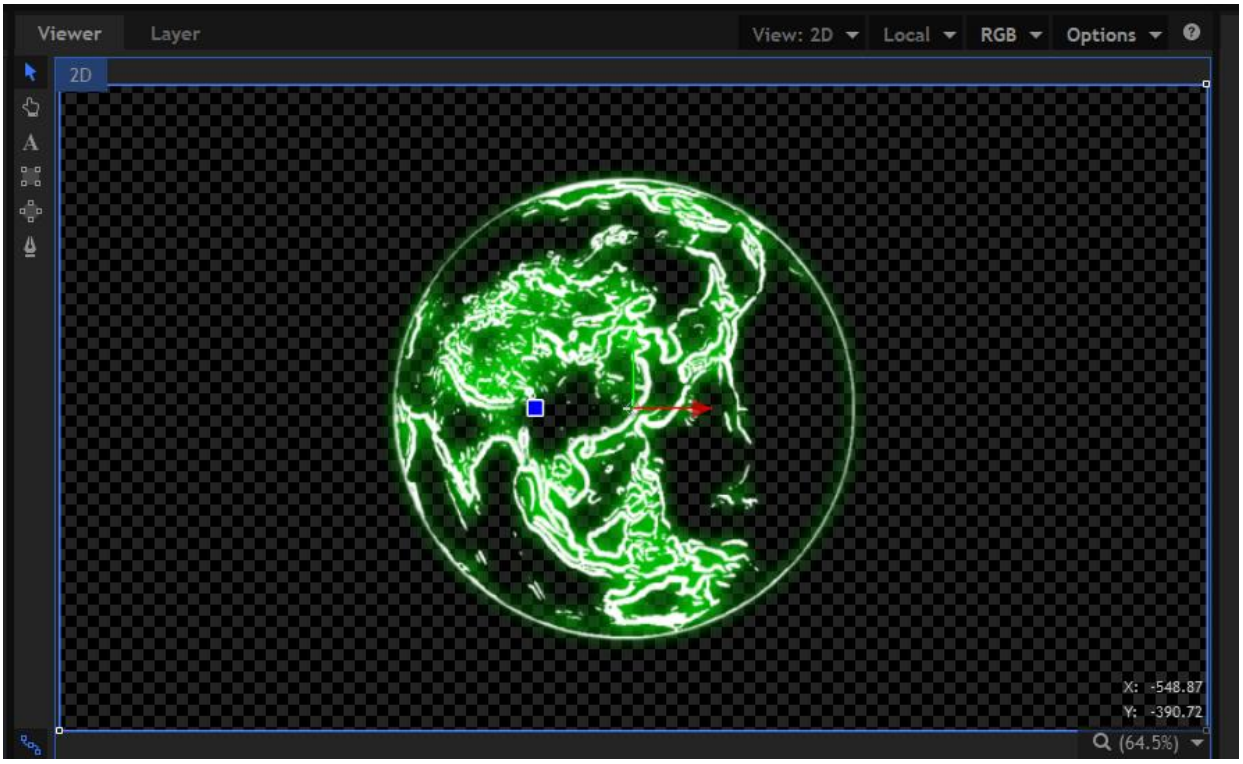
- Add the “Find Edges” element.

- Change the settings of the “Blur” till you are happy with your detected edges. These edges are going to glow in a green color in the hologram (or whatever color you prefer).

- Add the “Hue & RGB Key” to remove the black parts.

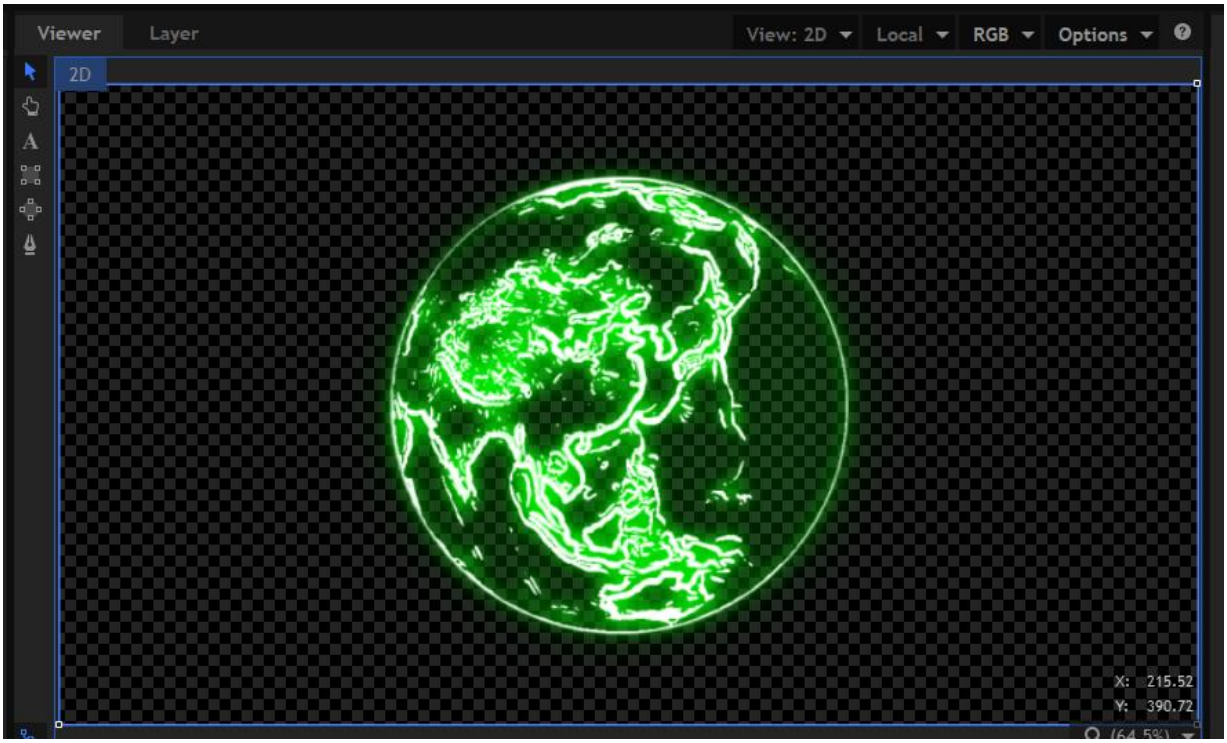
- Add the “Threshold” to make the edges white.

- Add the “Neon Glow” effect in whatever color you like and adjust the parameters.



- Add a new plane layer beneath your result in the color of your neon glow.

- Turn down the opacity.
- Select an ellipse mask around the earth in this new plane.
- Add the “Blur” effect to this plane.



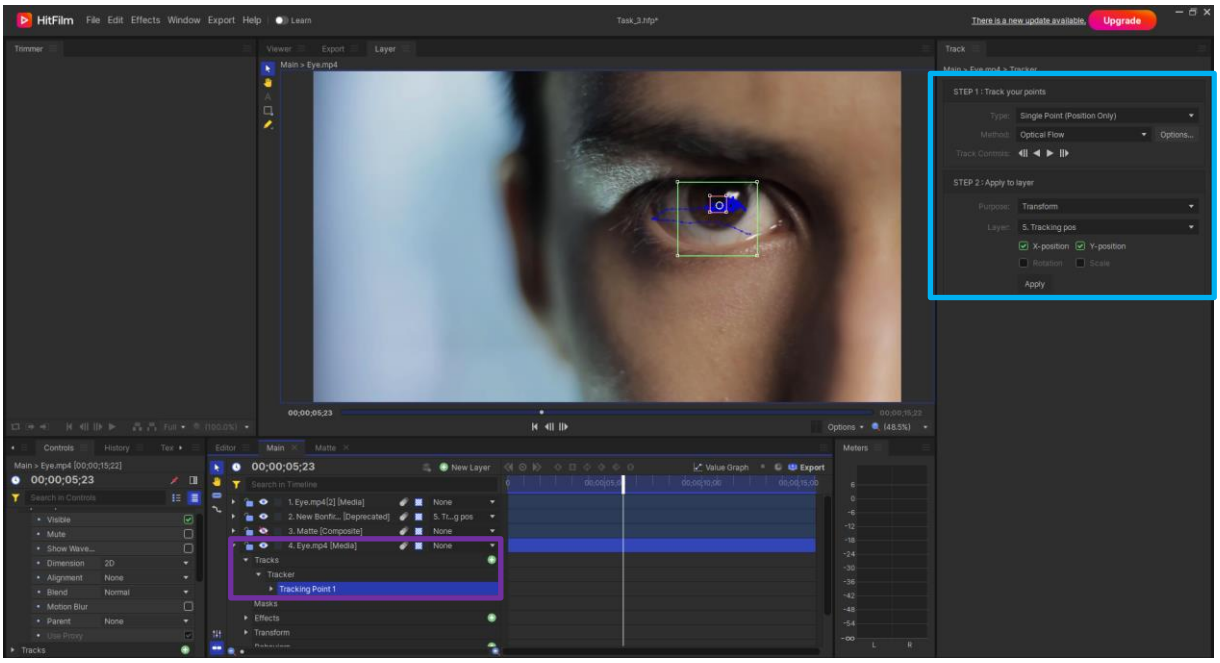
- Now we are ready to include this hologram into the scene.
- Go back to your “Main” composite shot and drag in the “Hologram” composite shot.
- Place it over the black ball on the table.
- Add a new plane layer in the color of your neon glow again.
- Select a freehand mask and form a cone from the ball to the earth (do not lead the mask through the globe but around it in a half-circle beneath it) and add the “Blur” effect.

Discussion

- Discuss your results! Describe differences to the solution in TUWEL! What do you like about your result and what could be improved? (Only hand in one file for all discussions of this exercise!)

Task 3 – Tracking and Mattes (40 points)

Tracking allows you to automatically follow objects in your scene which can be used for visual effects. After you have created a composite shot you can add a tracker when you open up the parameters in region 3 and click onto the + sign at “Tracks”. This allows you to place the tracker at a specific object in your scene at the preview in region 4. The red rectangle has to contain the features that shall be tracked and the greed rectangle selects the area where the feature is searched for step by step. Take a look at the screenshot beneath. The blue rectangle contains the settings for the tracking. After you placed the red and greed rectangle accordingly you need to press onto the play button at the “Step 1” region. Now the tracking is done for the video starting at the selected frame till the end. Once the tracking is finished you need to apply the positions to a point layer (you need to create this layer before). In the “Step 2” region you need to select your point layer and press **apply**.



You can **parent** other layers to the point layer. This can be done by selecting the respective point layout in the combo boxes at each plane (see purple region).

Mattes are used to combine several shots into a single one. You can imagine them as binary masks with let's say black and white areas. The white areas define which part of a respective video shall be visible. In this task you are going to create a matte that looks similar to this:

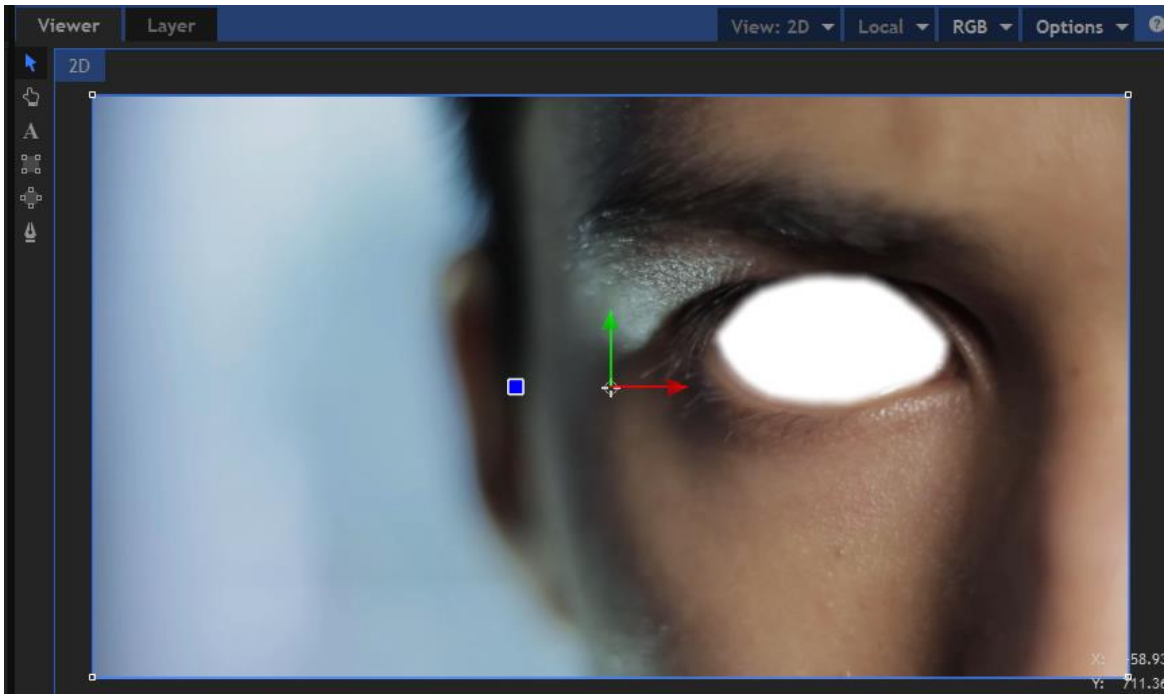
In this task, we are going to add effects to the eye of a person.

Steps for Task 3

- Import "Eye.mp4".
- Make a composite shot of it and name it "Main".
- Track the eyelid.

- Add a tracker to the composite shot as described above.
- Start the tracking at around second 8. Make sure, that you afterward also generate the matte at second 8.
- Set the red and greed rectangle to a spot so that they cover a part of his lower-middle eyelid.
- Apply the tracked points to a point layout.

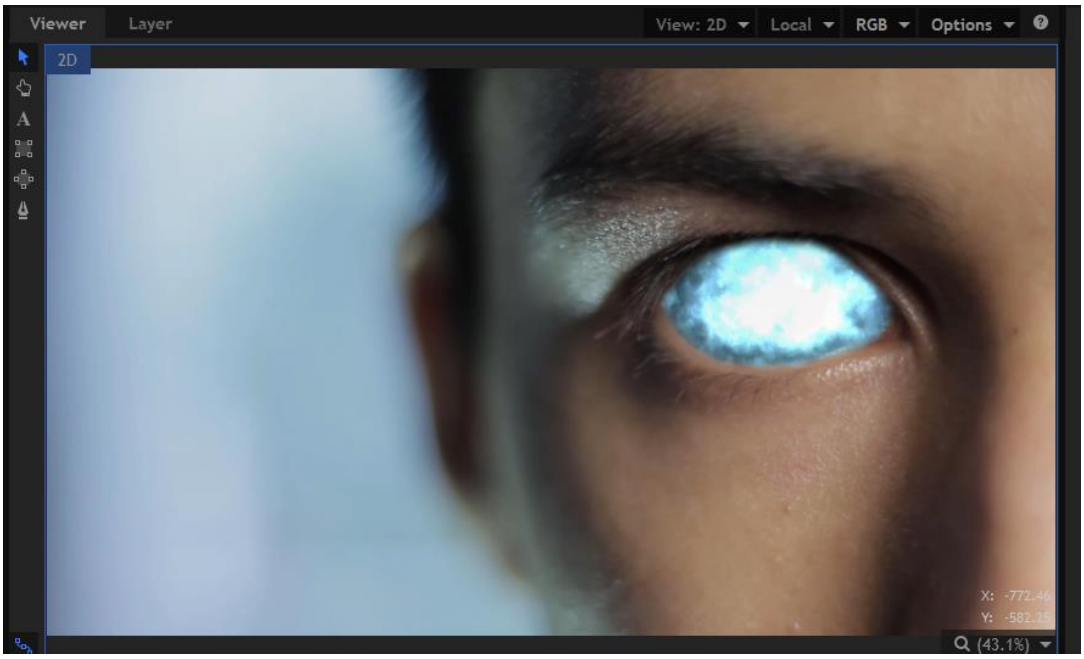
- Create the matte
  - Make a new composite shot of Eye.mp4 and name it “Matte”.
  - Copy the point layer from your “Main” composite shot.
  - Go to around second 8.
  - Create a new “Plane” layer in white.
  - Turn down the opacity to see the footage behind it.
  - Use the freehand mask tool (similar to the lightsaber task) and surround the eye with the control points.
  - Parent the white layer to your point layer.
  - Turn up the opacity.
  - Increase the feathering to smooth the edges of your mask.
  - Your result should look like this:



- Add a black plane layer beneath your previous plane layer (white).
- Now you should have created a black and white mask for the matte.

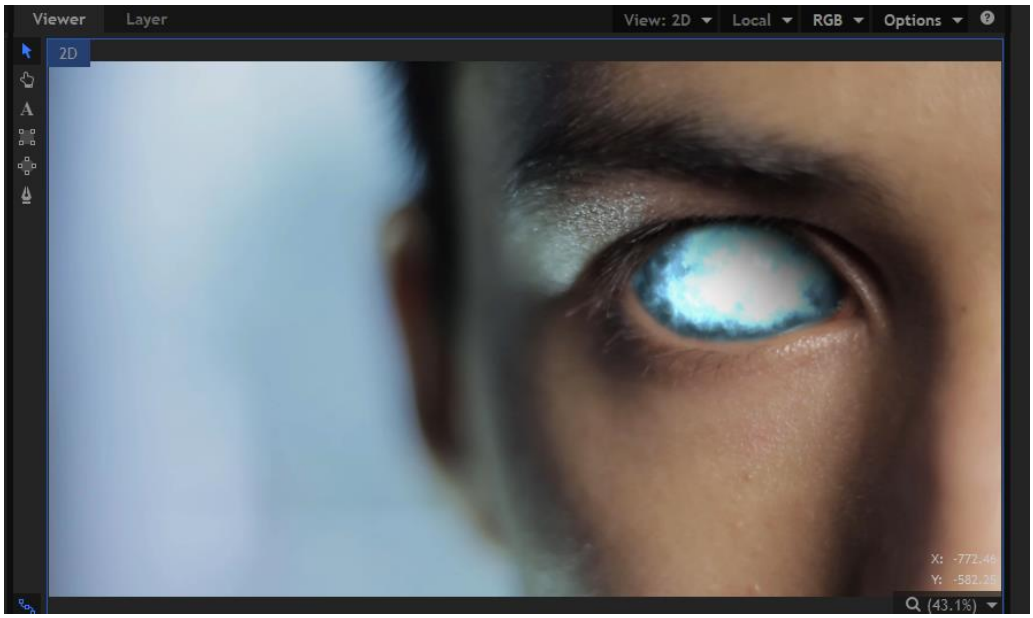
- Add effects
  - Go back to your main composite shot.
  - In region one, where you import the videos, you can now see your “Matte” composite shot. Drag this into your main composite shot under your video.
  - Add the “Bonfire” effect and do the settings however you like. I used a blueish color. Change the size accordingly. (This effect is deprecated, but it can still be used)
  - Go to around second 8 and position it above the eye.
  - Add the “Set Matte” effect to your bonfire and set the source layer to your matte layer. Set the “Matte Source” to “Luminance” and the “Blend” mode to “Replace”.
  - Lower the position of the bonfire (y-axis) and keyframe it to move back up again, like in the resulting video on TUWEL.
  - Keyframe the opacity to let the bonfire fade in.

- Your result should now look similar to this:



- We are going to add some more effects to make the scene look more realistic and make the effect look more attached to the scene.

- Make the effects appear more realistic.
    - First, we are going to add shadows to the effect.
    - Add the “Vignette” effect to your bonfire.
    - Change the parameters to match the shadows of the face.

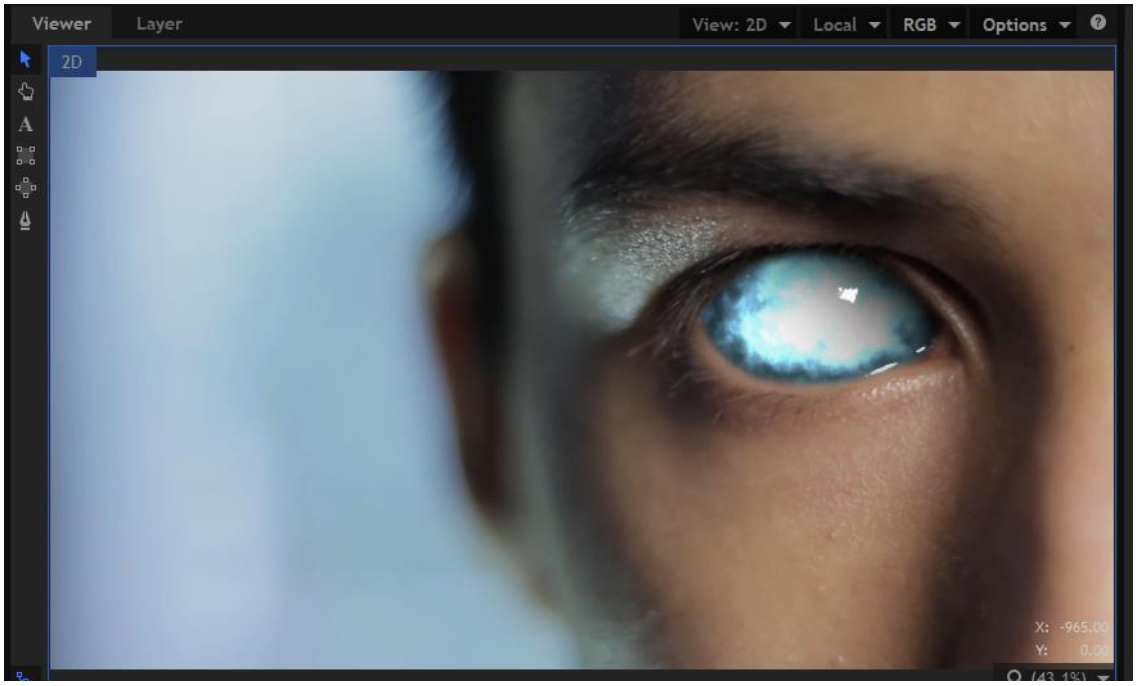


- If you take a look at the original footage, you will detect reflections in the eye. We are now going to add those.

- Duplicate the layer of your source footage and place it on top (Strg + D or copy and paste).

- Add the “Luminance Key” and adjust the parameters to select the reflective parts in the eye.

- Your result should look like follows:



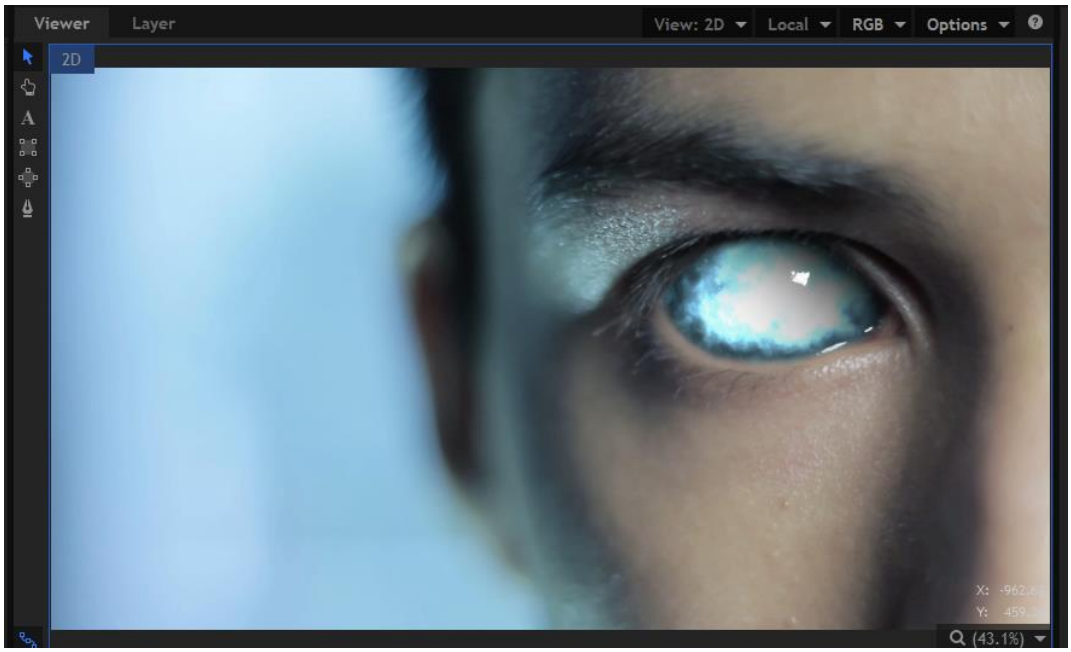
- As a final step add the “Color Balance” effect to the layer that contains the main footage.

- Change the “Shadows”, “Midtones” and “Highlights” to a color that matches your previously selected one for the bonfire in the eye.

- Keyframe the red, green and blue balance of the three color balance attributes from 0 to your selected color while the opacity of the bonfire gets larger.

- Add background music that matches the “atmosphere” of your video. You need to switch to the editor tab in region 3 and drag your main composite shot into it. Then you can add an audio track. I faded it out at the end using the “Fade” effect. When exporting this, you need to set the start and endframe via “i” and “o” like in exercise 1.

- Your final results should look similar to this in the color you selected:



Discussion

- Discuss your results! Describe differences to the solution in TUWEL! What do you like about your result and what could be improved? (Only hand in one file for all discussions of this exercise!)

Task 4 – 3D Particle System and Fractal Displacement (40 points)

During this task, we will produce a vanishing effect by employing a 3D particle system that gets displaced via fractal features. The effect lasts for a short amount of time but several adjustments need to be made to look nice. As you can see in the video on TUWEL, the particle system is generated based on the two people that are in the scene. Make sure, that the prominent colors of these two are visible in the particle system => some masks are necessary. The position of the two people changes a little so you need to keyframe the masks over time. The first mask needs to be detailed and the borders should match. For the latter frames, you can keyframe the x, y position and the size of the whole mask so that you don't need to keyframe the whole path over 25+ frames. Parts like the wand should displace at the beginning of the transition as well but you can make the mask opaque in latter frames.

Steps for Task 4

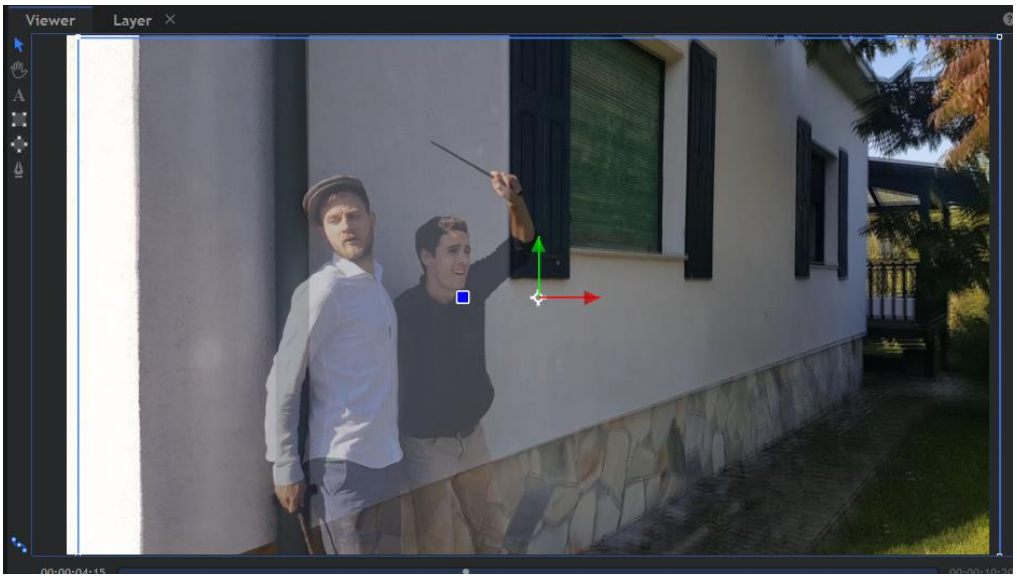
- Import "Vanish.mp4" and "CleanPlate.mp4"
    - The Clean Plate shows the scene without the actors and needs to be used during the transition.

- Make a composite shot of "Vanish.mp4"

- Include "CleanPlate.mp4", start with a low opacity and keyframe it up to 100 when you wand the transition to start (when the wand is caught).

- Make sure that the positions of the main footage and the clean plate align during the transition as well as possible. We can correct wrong behavior at the borders using a grade layer and a shake effect later on.

- Your result during the transition should look similar to this:



- Duplicate the main footage layer and place it on top. This layer will contain the masks and will generate the particle system. Feel free to rename it so that you don't lose the overview.

- Trim the particle layer to start before and end after the clean plate takes over by using the slice tool (it looks like a razor blade left to the different layers). It does not matter if this layer lasts for too long (in both directions).

- Create masks to cover the most important parts of the actors. I used several different masks. You can try different versions and see what works for you. If one is sufficient for the result to look nice it's fine with me ;) Use the freehand mask tool for the mask like in previous exercises. You can keyframe the path, the x, y position and the scale over the next frames as long as you want the vanish effect to last. (Click onto the blue eye of the clean plate layer to hide it. Otherwise, you won't see the actors) Make sure that your masks do not contain background objects like the wall because if you do so, your particle system will contain the wall too. It should only contain the actors.

- In most cases, the effect should not last longer than 0.5s / 1s because then the audience will detect how the effect works. Therefore, you do not need to create masks for longer than one second. You can create your first masks and continue with the next steps to see how it looks like.

- Add the "Atomic Particles" effect. This effect is from an add-on so you won't be able to export it without a watermark. Therefore, it's even more important that you hand in your HITFILM project files.

- Change the "Displacement Strength" and the "Wavelength" at the "Fractal" parameters of the effect. The image below shows an example of the masked black

pullover. The two mentioned parameters do not need to match my values exactly but the end result should look similar.

- Furthermore, you need to change parameter values for the “Size” under “Particle Appearance” as well as the number of particles in x and y-direction. Some of the parameters need to be keyframed. Experiment with other parameters until you are happy with your result. Make sure, that your particle system grows and shrinks over a few frames, around 5 – 15 depending on your liking. I also left the particle system at full size for a few frames and changed the rotation etc.

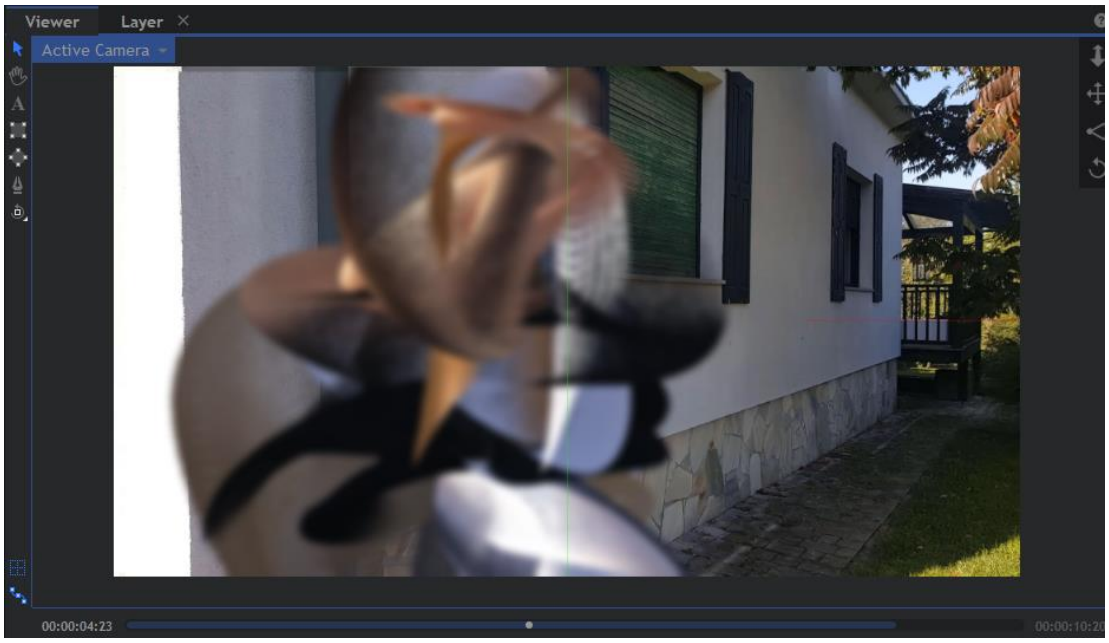
- Add a new point layer and make it 3D. You can do that by clicking onto the chessboard pattern. This point will control the shrinkage of the particle system and the point where it will shrink to.

- Under “Atomic Particle”, “Particle Placement”, “Position”, “Transform Form” select the 3D point layer you have just created.

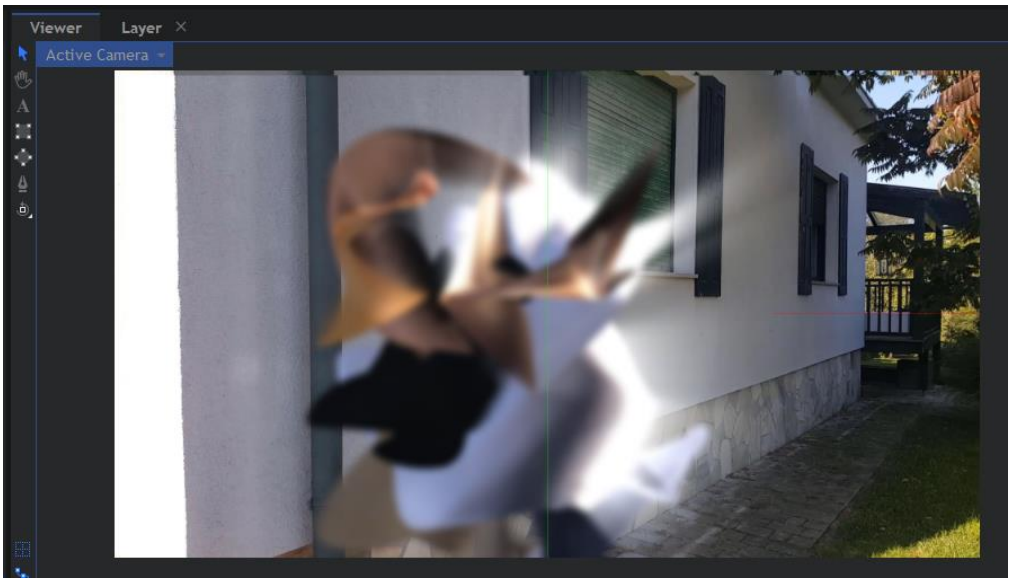
- Keyframe the “Scale” of the 3D point layer. Start the shrinkage a few frames before the effect shall end. Adjust the x y position as well as the x y anchor point of the 3D point to a position where you want the effect to disappear.

- Add a “Blur” effect under the “Atomic Particles” effect and keyframe it up during the particle system grows. One result in between showing only one mask could look similar to this:

- With all masks active, it could look similar to this:



- Add the “Auto Volumetrics” effect and keyframe and set the parameters as you like.



- Add the “Radial Blur” effect to the clean plate and keyframe it to add some blur during the transition. Don’t overdo it ;)

- Add a “Buldge” effect to the clean plate to create a spherical distortion at the end of the shrinking to add the effect of a warp in space. In my case, the particle system vanishes at the white wall so I overdid the buldge to be visible at the gutter.

- Add a new grade layer on top. We will make the transition even more hectic by keyframing a shake amount into the scene (“Shake” effect). Change the scale parameter to hide the wrong border of your shot that got introduced when aligning the clean plate with the main footage when the clean plate takes over.

- I added a lens flare to the top of the wand and background music + sound effects. You don’t need to do this, but feel free if you would like to. Make sure, that your particle system grows and then shrinks into one small point.

- We were using add-on effects during this task so you won’t be able to export the video without the watermark. Therefore, it’s even more important that you hand in the HITFILM project file.

Discussion

- Discuss your results! Describe differences to the solution in TUWEL! What do you like about your result and what could be improved? (Only hand in one file for all discussions of this exercise!)

Task 5 – Freestyle Magic (25 points)

Take a look at the finished video on TUWEL. In this task, you have to take a video yourself and add some magic effects. You can use a self-produced video. If you don't want to be in the shot you can also take a video of your hands, a wand, record some gameplay, or edit a video from the Internet (I'd recommend MediaHuman's YouTube downloader for that), etc. You may use "Curves", "Levels", "Brightness & Contrast", or similar to color grade your result.

Obligatory for Task 5

- The video has to be 10 to 20 seconds long.
- You need to use background music and at least one sound effect.
- You need to use a manually selected point layout, tracking, or keyframing for the position of your magic effect.
- Add at least 3 effects.
- Be creative ☺

Have a look at all the effects that HitFilm has to offer. You can also use "Light Flares", "Bonfires", "Lightning & Electricity", etc. from the Quick 3D effects even though they are deprecated.

Discussion

- Discuss your results! What do you like about your result and what could be improved? (Only hand in one file for all discussions of this exercise!)