

Homework 1

For this assignment, our homework was to use the NST method to transform our 2 content examples with 2 different styles each. First, I chose two characters from the games I played when I was young (**Nasus** from League of Legends “**Figure 1**” and **GTA** cover from GTA “**Figure 2**”). After choosing my example, I chose the **Starry Night** painting by **Vincent van Gogh** (**Figure 3**) and **Composition 8** by **Wassily Kandinsky** (**Figure 4**).

To transform my examples, I used the source code from **TensorFlow** and my environment was easy to set up because I used **Google Collab** to run and transform. However, I found TensorFlow’s Google Collab source code to little bit tedious to experiment with. Therefore, did a little more research on youtube and found a video that implemented the source code into a much easier form and followed his instructions.

The Algorithm I used uses the PyTorch implementation of the paper A Neural Algorithm of Artistic Style by Leon A. Gatys, Alexander S. Ecker, and Matthias Bethge. The code is based on Justin Johnson's Neural-Style. To test the algorithm we first need to download the packages into your google drive and mount your google drive. This procedure was easier to use because I do not need to set up an environment since Google Collab does it for me. Thus, I would need the images to be high-resolution PNG and insert them into their respective folders inside my Google Drive. To get the results it takes about 10-20 minutes. The results are shown below.



(Figure 1: Nasus)



(Figure 2: GTA)



(Figure 3: Composition 8)



(Figure 4: Starry Night)

1) Example 1: Nasus (Leauge of Legends)



(Figure 1.1)

This transformation is with Composition 8 (Figure 1.1). Overall, I think this is a great transformation and the details are spot on. Especially the face, hand, body armor, axe, background, and so on. However, I think it could have done a better job with the rightmost front leg and its surroundings.



(Figure 1.2)

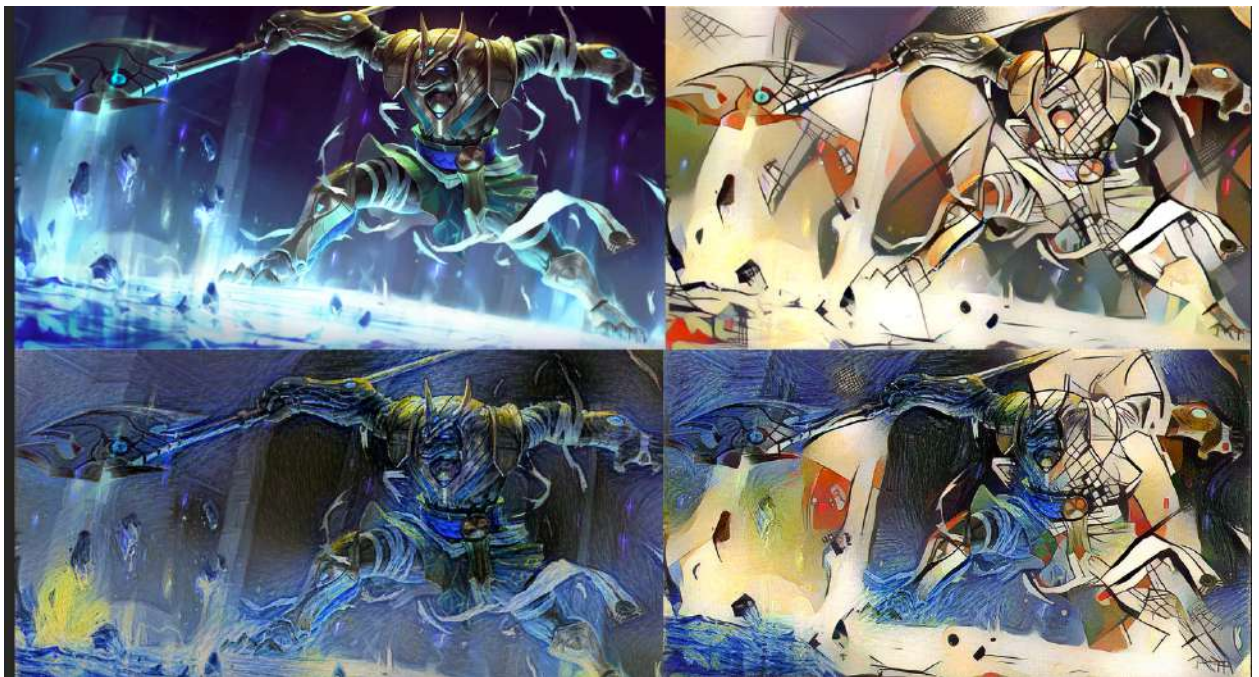
To contrast, this is the transformation with Starry Night (Figure 1.2). In my opinion, the algorithm transforms the Nasus picture well because you can see details such as the floor, body, and everything.



(Figure 1.3)

Next, I wanted to test 2 different styles on the same painting and see how the algorithm reacts and transforms the picture. I chose these paintings on purpose because they do not complement each other where they are hard to transform and I thought it would be interesting. If I were to rate this picture out of 10, I would give it a 7. Although it successfully uses the two paintings clearly where the picture now looks like he is swinging his axe and tearing a new portal to a new demotion, the left leg of the body is not so clear and around the head armor it does not combine well as I imagined. Thus, the background apart from the left leg is clear and perfect.

Also, I notice that the hand does not have an axe is a good representation of this NST method because the hand uses Composition 8 but the background is Starry Night where it kinda looks like he is squeezing the air around him.



(Figure 1.4 Side-by-Side View)

2) Example 2: GTA Cover (GTA Game)



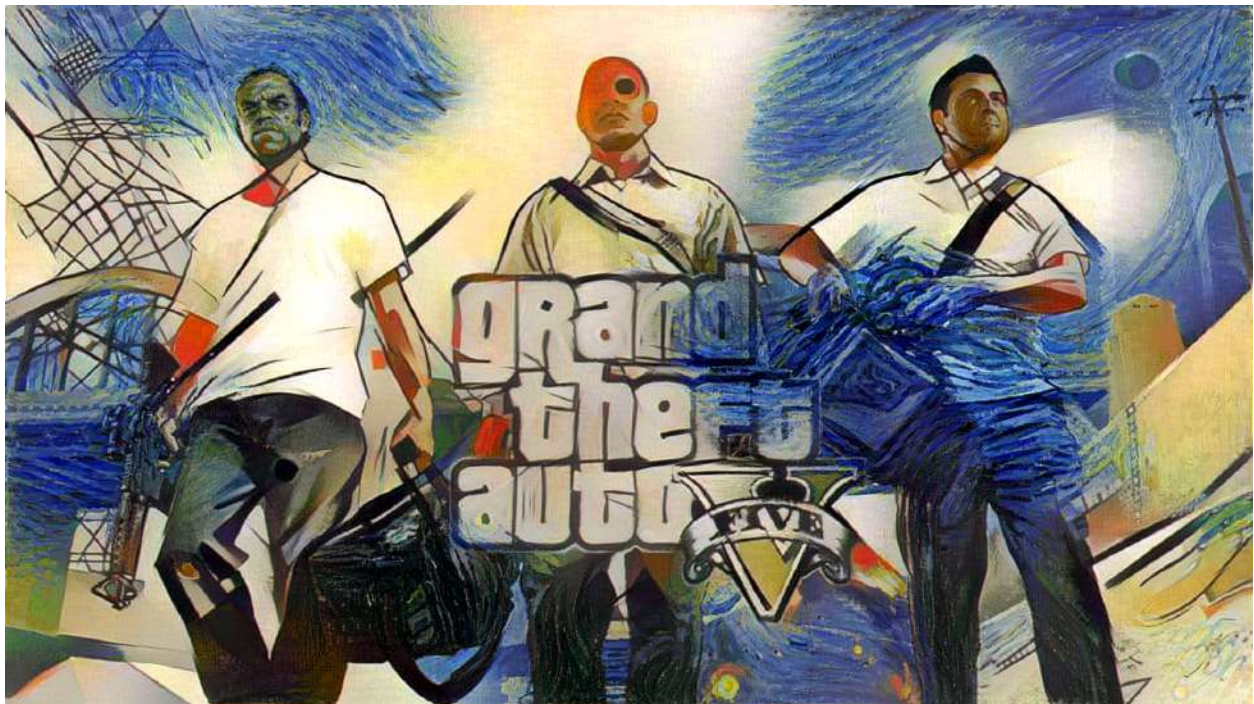
(Figure 2.1 Starry Night)

For this content, the algorithm does a great job with the background and the people in the front. Not to mention, the game article is also blended in well. The yellow spot on the leftmost guy is also a good touch. I would personally consider making this my wallpaper.



(Figure 2.2 Composition 8)

Although it is blended successfully, it does not look well. For example, the faces of the guys in the picture and around the rightmost guy in the background do look as well as I thought they would. However, the bags that the guys are carrying and the game article looks good enough to be a theme.



(Figure 2.3 Mixed)

For my final test, I tried both of the painting styles together. Honestly, it looks like it glitched but in a good way. My favorite part of this transformation is the bag and the bridge. I think the faces could have been better but since it is in google Collab I would need more power in gigabytes which I am not willing to pay to Google.

In addition, the explosion in the background from the original picture is captured whereas it was not detailed well as this transformation. The output is not changeable and I could understand the code fully so I can not implement any of it. Since that is the case, this is the best it can be transformed with Composition 8. The Composition 8 style does not go well with the GTA content I tested with.



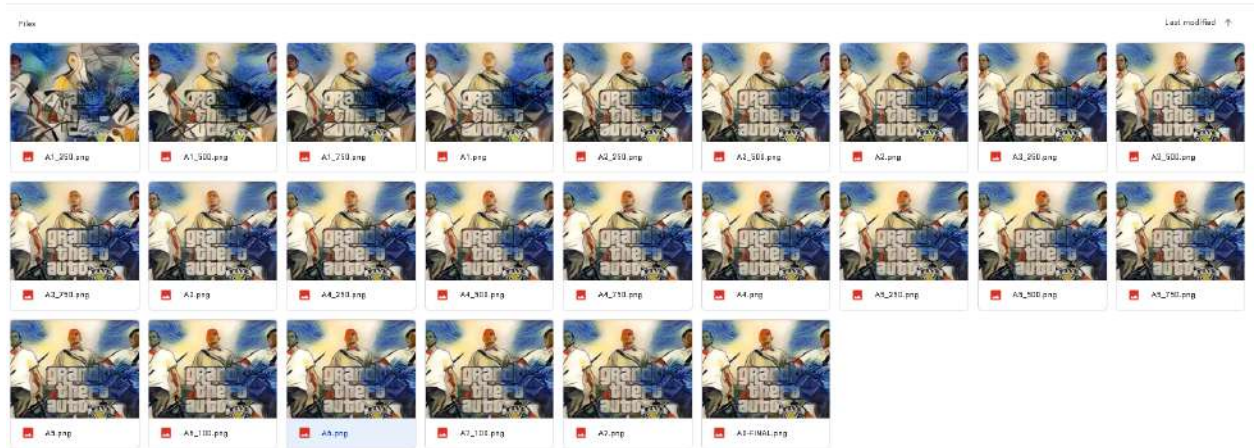
(Figure 2.4 Side-by-Side View)

3) Conclusion

In conclusion, neural style transfer is an exciting technique that offers numerous creative possibilities. By leveraging deep learning algorithms, NST can combine the style of one image with the content of another to generate new and interesting visuals. While NST can be a powerful tool for designers, photographers, and artists, it is important to keep in mind the challenges that come with understanding and modifying the output of the algorithm, as well as the potential copyright issues that may arise from using copyrighted images. Therefore, it is essential to approach NST with care and to ensure that any resulting artwork is produced in accordance with legal and ethical standards.

Moreover, the potential of NST extends beyond artistic expression and can be applied to various fields such as architecture, fashion, and the film industry.

With the advancements in deep learning and computer vision, NST has the potential to transform the way we create and visualize art, design products, and communicate ideas. As such, it is an exciting area of research that will continue to evolve and offer new possibilities in the years to come.



(Figure 3.1 Transformation checkpoints)

4) Source:

Example pictures: Google

NST algorithm: <https://github.com/ProGamerGov/neural-style-pt>

Youtube video: <https://www.youtube.com/watch?v=orWegmlAZC4>

Google Colab:

<https://colab.research.google.com/drive/1e9To5eO9SBn5ngCMGbDqoIM0AWja5LjR#ofline=true&sandboxMode=true>