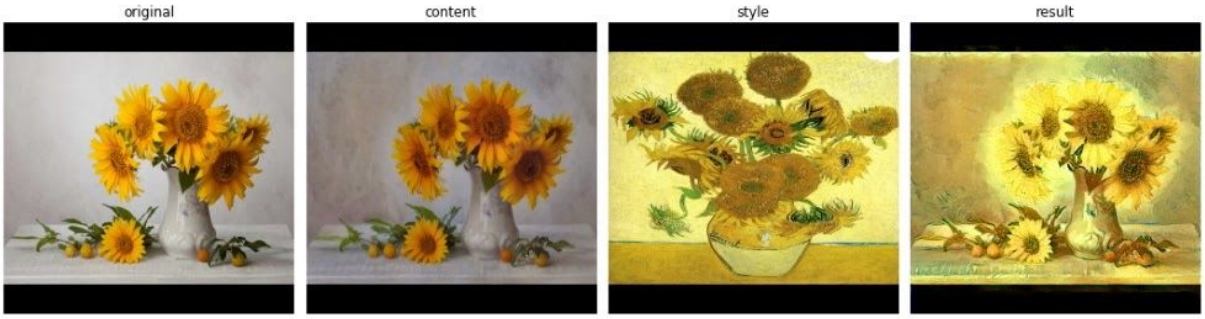
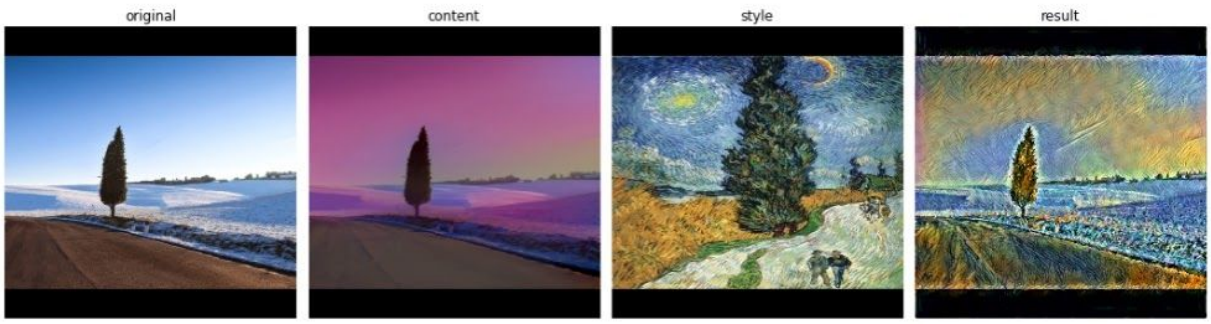
Deep photo style transfer and style transfer:



From the image selection, we select the sunflowers on the desk. However, the background, desk and the bottle are white. So, we decided to use the deep photo style transfer to add a slightly yellow color in the background, desk and bottle. Then we use the generated image and put it into the style transfer model. In this case, the style we choose is the oil painting Still Life - Vase with Fifteen Sunflowers. Comparing between the results and Van Gogh's painting, they have a very similar main color which is light yellowish brown on the staman of the sunflower and the brushwork almost are the same. In a more detailed way, the image shows the yellowish brown as bottom color and just uses a little brown or black to emphasize the seed of sunflowers.

However, the CNN style transfer model didn't detect the stem and leaves correctly. The stem and leaves should be green in the image. The yellow pancel did not detect the desk and background of the images. It generates the same color for the desk and background. But Van Gogh did use the differences between the yellow saturation to distinguish them. Van Gogh's painting is more abstract, for instance, most of the stem of his sunflower is curled. And for our generated image, they cannot copy these features, because we are using the real images.



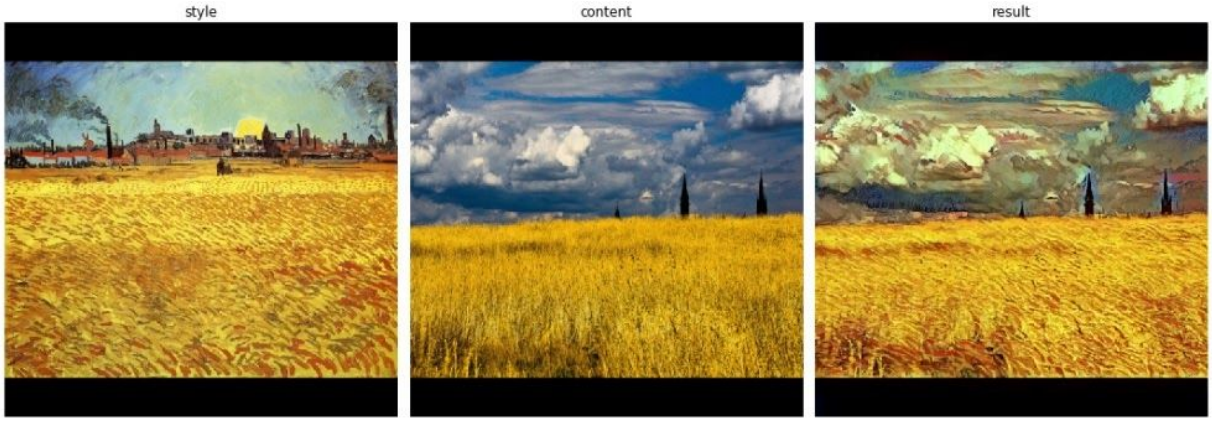
This is another example that we use the deep photo transfer and then use the style transfer. We select 2 images that have a huge difference in color because we think our original color is so monotonous. The ground is covered by snow. Then we put into the style transfer and get our final result.

However, the result cannot transfer as a successful or similar result. Because you can notice there exist differences between our generated image and Van Gogh's painting. The sky didn't show in blue; the snow ground was in blue rather than yellow; the road color is still black. We think the reason for this problem is the real image we choose is not pretty good. For Van Gogh's painting, it has a huge tree in the center of the painting. But for our pick image, it only has a small tree on the left side, even though we choose the most similar images. When it transferred, it could not detect the tree, road and grass land. Also, our result for deep photo transfer is not good either. We seeked to change the grass color to yellow. The generated color in this result is a weird purple and it is really different from our ideal result. So we think it is pretty important to choose a good picture for both 2 models and a good style picture to change the color or background of the result of deep photo transfer.

Only use the style transfer:

We selected an oil painting from Van Gogh, called Irises as our style training data. We choose the same color irises in purple and green. The saturation is heavier than the oil painting. We use the style transfer to run the real image and get our generated image as a result. It performs well and looks pretty similar with Van Gogh's painting in many ways. In the original painting, Van Gogh used light blue and dark blue to distinct the facing side of the irises flowers and use a mixture yellow, green and white on the leaves and stem. In the result, it also uses the light purple to depict the part of flowers that get the sunlight contrasting with the dark purple. The style transfer captures the leaves and stem colors correctly. Furthermore, it used lighter color to highlight the reflection of the sun on the leaves and stems.

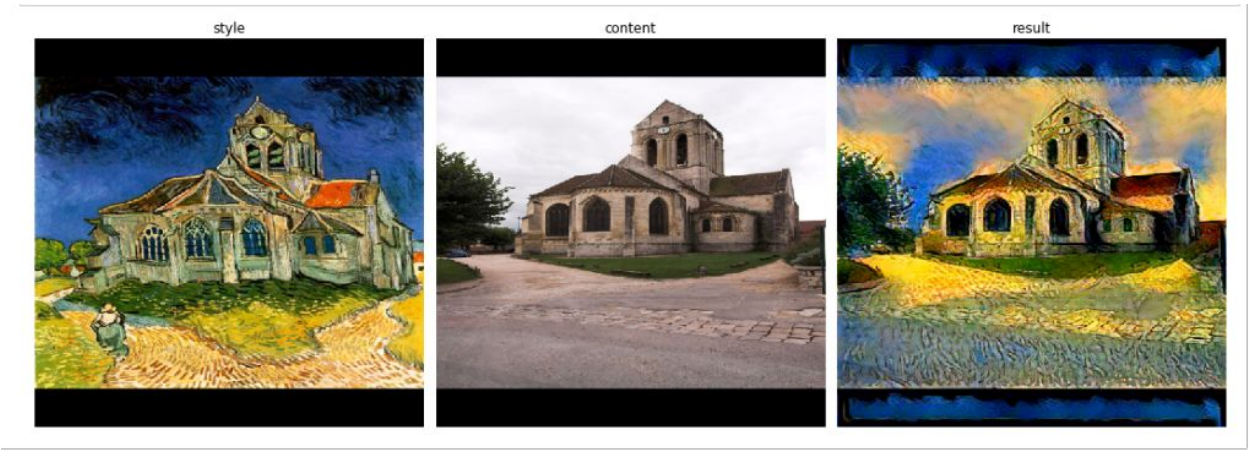
In Van Gogh style, he would like to use abstraction to present the landscape. However, the model could not modify it on the edges of the flower. Also, we can see the color of the flowers are different. Most of the irises are purple, but Van Gogh painted it as blue. I think it is an expression of abstraction in his way. The background of the result is blurred rather than a group of flowers in distance. The background generates the color from black to brown, which is shared as part of the color of soil. But the model generated is not enough, because it is a mixture of the brown and green as the background.



We used the painting of Summer Evening, Wheatfield with Setting sun as the style in the CNN style transfer model. We found a similar composition image about the wheatfield and used the style transfer to this image. The results turned out pretty well. The brush stroke on the wheatfield resembles in detail. Both used the light yellow as the wheat field and added each curl line of brown yellow as a single wheat for adding the layering. Also, they presented the similar shape and similar direction for the wheats.

However, the line of wheats from the result is blurred than the original one, because we use machine learning to produce. Also, the original painting's background is a small industrial

country at sunset time. But the building in the background did not show in detail. It only presented a shadow outline in the distance. Van Gogh presents the sunset's aperture with green yellow and the sun in pure yellow. But the cloud in the sky painted in the sunset's aperture color as a result. The model can't detect the cloud, so it treated the clouds as the sunset's aperture.



We found the prototype from Van Gogh's painting at Auver. Generally speaking, our generated image from the style transfer does not look very similar with Van Gogh's painting. In a more detailed way that, for Van Gogh's painting, it is more abstract, because the way he used the curl lines to depict the building. But for our generated image, it tends to be more realistic that it does not use curl lines to depict the building. Also, the sky is still in yellow mixed with blue, but not blue and black.

However, if we look at the details, we can see some places look really similar. For example, the way for using color for depiction and the brushwork for drawing the land. For the original photo we select, it is a concrete floor and a diamond concrete floor. We may think that the style transfer will still use some grey color to depict the concrete floor and the diamonds concrete floor as real. However, after we run the style transfer and get the generated image, we surprisingly find out the brushwork for our model used is pretty similar to Van Gogh's. Detaily speaking, they all use some thick color line to tell you this is a road.

As we can notice from the result that the model tries its best to generate some painting skills that Van Gogh has in his painting, like to use contrasting color and the brush stroke. But it cannot generate an image that perfectly has some painting skills like Van Gogh. So we will need to improve this model for better using the skills from the input artists. From these differences and similarities between both 2 images, we can say that for the generated image from the model, the model can just try its best to change to color and achieve the similarity from color. But it cannot change what the object looks like, the edges of the objects, for example like buildings. It

cannot change the straight lines to curl lines for letting the generated image become more similar with Van Gogh's painting.