

GAN THEFT AUTO

Hizal Celik ('18) | Oscar Dadfar ('21)

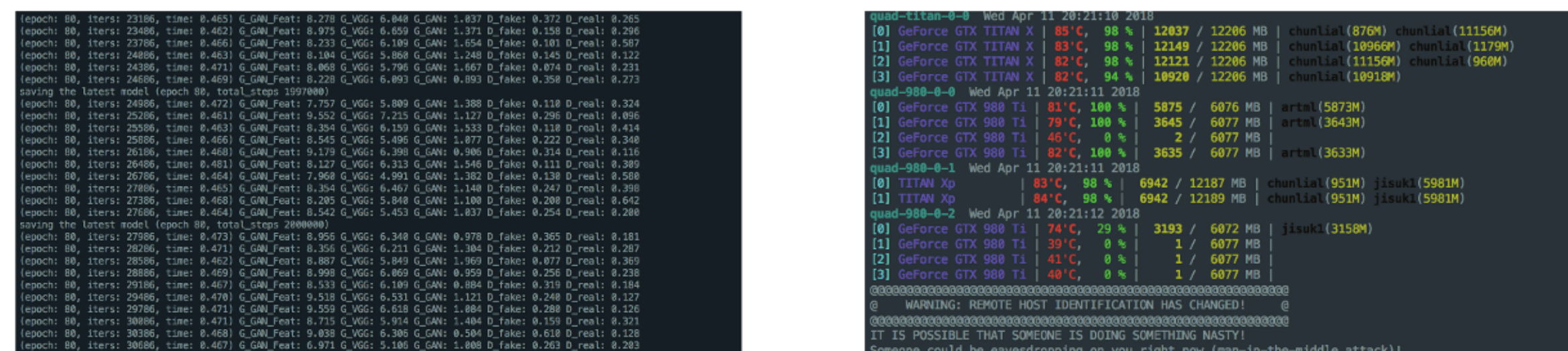
Concept

GTA GAN attempts to provide real-time style transfer of GTA skins onto a procedurally-generated Unity environment in order to simulate a real GTA game.

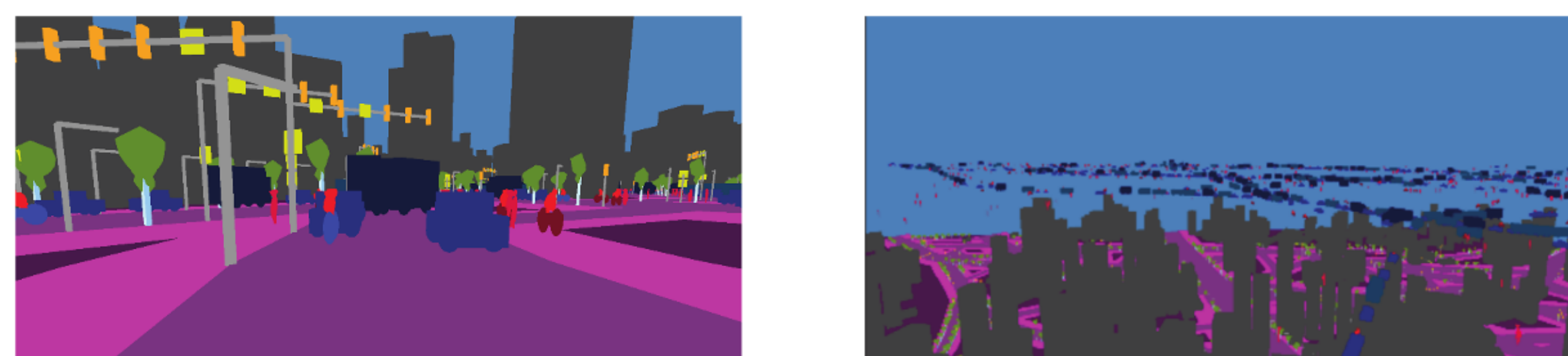
Players will be able to interact with the environment and generate image sequences for style-transfer and rendering.

Methods

Trained Pix2Pix (200 epochs) & Pix2PixHD (61 epochs) on GTX 980 Ti's.



Optimized Unity City by generating prefabs for each object rather than generating distinct models. Added the ability to control different objects (trees, cars, buses) and the ability to fly.



Included a script that allowed for direct transfer and style-transfer of images to provide real-time style transfer.



Related Work

L. Huang, H. Celik, S. Mani, "Photographic Video Rendering of Procedurally Generated Cities with Pix2pix," March 2018.

Providing a baseline procedurally-generated Unity environment with color mappings.

S. Richter, V. Vineet, et. al., "Playing for Data: Ground Truth from Computer Games," Springer International Publishing, 2016.

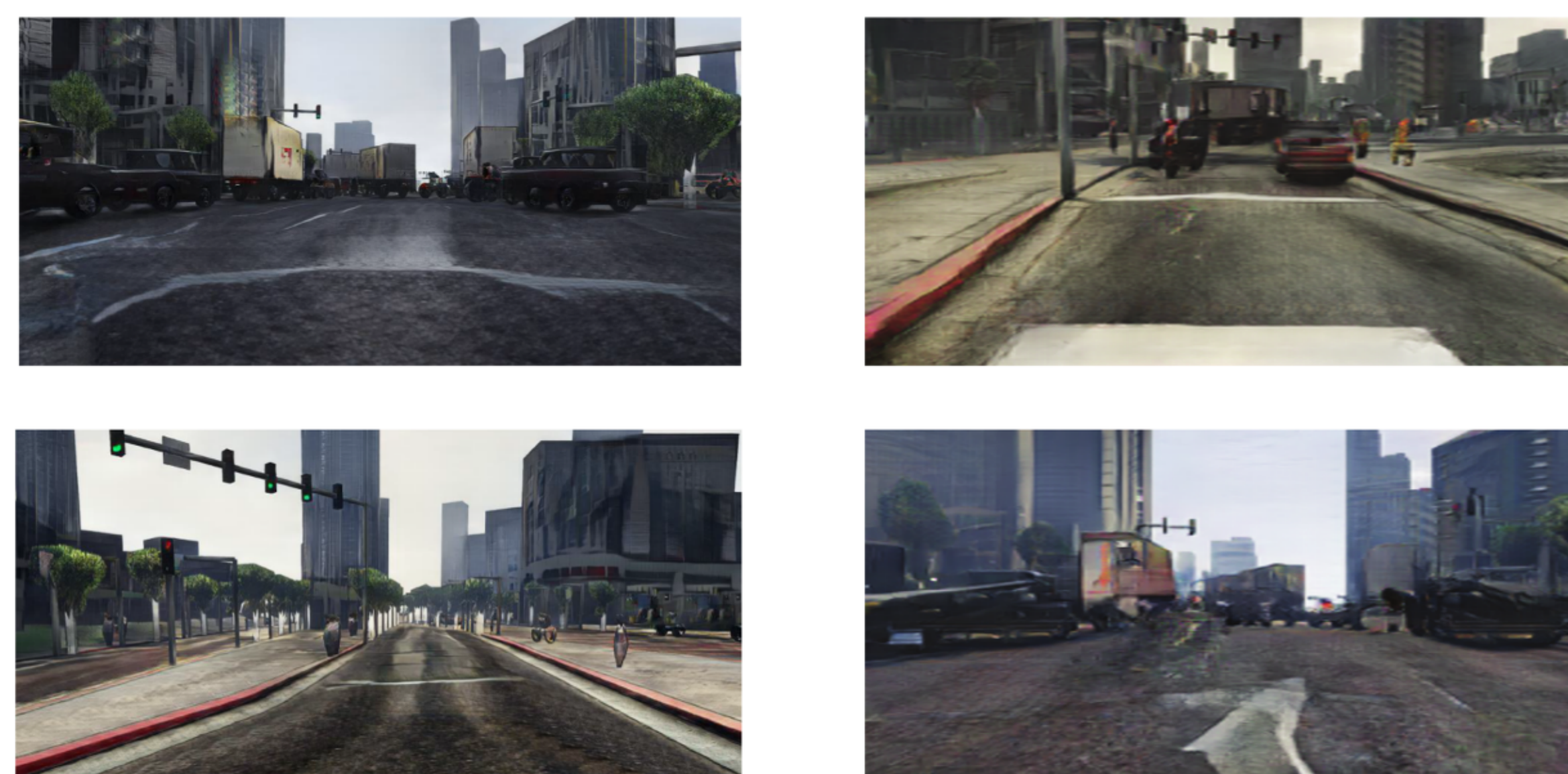
GTA Semantic Segmented Training Dataset

Approach

Huang, Celik, & Mani's research focused on using style transfer of the German Cityscapes Dataset onto exported frames of an interactive, procedurally-generated Unity environment. Our project in part required training pix2pix and pix2pixHD networks on the much larger, semantic GTA dataset.

We also added an additional component to make the style transfer process occur in real-time rather than having to manually import an image sequence into Pix2Pix

Results



(Examples of Pix2PixHD [Left] & Pix2Pix [Right])

In the process of transferring images from Unity onto a local server to handle the style transfer, there would be a loss of color mapping, resulting in colors from the real-time Pix2Pix style transfer to look dark and muddy.

The style-transfer process for Pix2Pix is also high-demanding, only outputting 2.5 images each second on a standard Macbook. Having a better CPU & GPU would to host the server would increase the FPS.

Special Thanks

Jonathan Dinu

Lingdong Huang

Prof. Kang

Aman Tiwari

Prof. Pozcos

And to Viewers Like You :)