Entering the Metaverse

Using **Neural Style Transfer** to **Personally** Enter Web3

01 **Purpose**
Why?

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04 **Future Work**
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Purpose

01

Introduction to NFT’s and Project Goal

“[An NFT] is a pointer, it is a channel, it is a link, communication between you, the creator, and the community, and any kind of value that can be funneled down that.”

- Naval Ravikant

What are NFT's?

NFT - **Non-Fungible Token**

Unique and can't be replaced

Provide **digital ownership** that is **verifiable** on an open platform

Powers the possibilities of **Web3**

They can take on many forms, but their **primitive form** is **Art NFT's** (Gall's Law)

$10,670,000,000

Q3 2021, 704% increase from previous quarter

https://www.cnbc.com/2021/10/06/nft-trading-volume-hit-10-billion-2-reasons-why-people-are-buying.html

Art NFT's derive value from many sources (status, community, scarcity)

My project's focus lies in the user identifying with the NFT

The goal of this project is to create human-NFT hybrid pictures that can enable the user to further enter the Metaverse

Model Breakdown

02

Explaining Neural Style Transfer Models

A Neural Algorithm of Artistic Style

Leon A. Gatys (2015)

Utilizing Deep Neural Networks, we can create artistic images

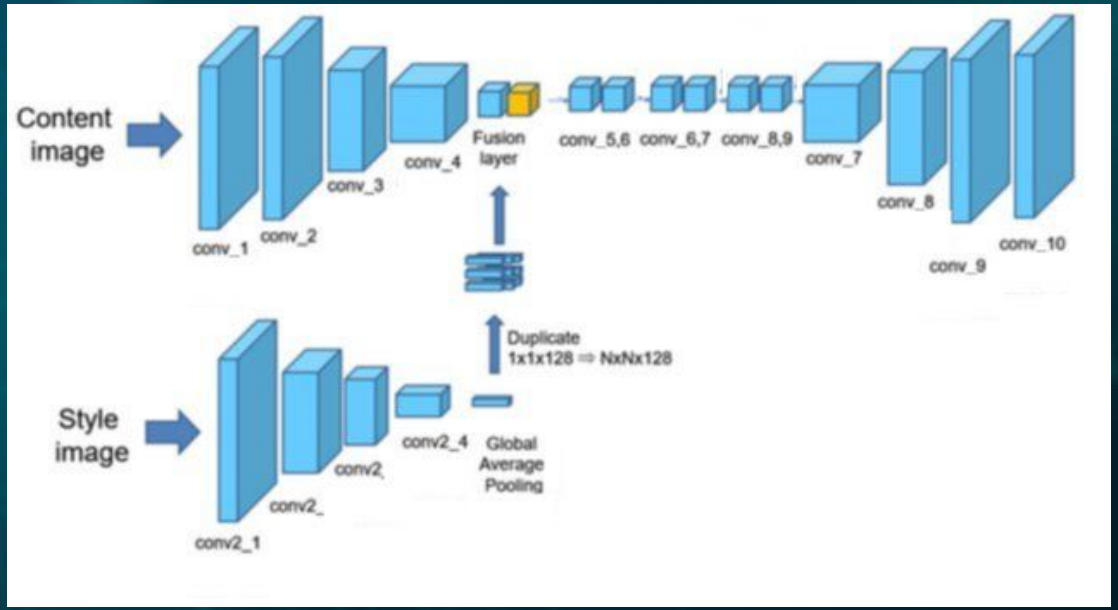
Model isolates features from both “content” and “style” images and then fuses them together

A Neural Algorithm of Artistic Style

Leon A. Gatys (2015)

A Neural Algorithm of Artistic Style

Leon A. Gatys (2015)



Model Results

03

Hyperparameter Tuning & Resulting Images

Model Hyperparameters to Tune

Model Learning Rate

Alpha

Weight for transforming content

Content Weight

Weight for transforming style

Style Weight

Exponential decay rate

Beta_1

Constant for stability

Epsilon

Used for Convergence

Amsgrad

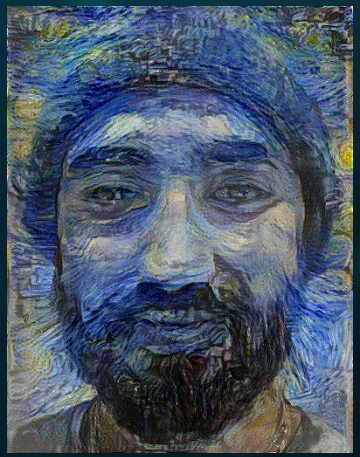
Out of the Box Model (1,000 Iterations)

Optimizer	ADAM
Alpha (LR)	5
Beta	0.99
Epsilon	0.1
Content Weights	100
Style Weights	0.01

Content Loss	Style Loss	Total Loss
310,000	160,000	470,000

Out of the Box Model (10,000 Iterations)

Optimizer	ADAM
Alpha (LR)	5
Beta	0.99
Epsilon	0.1
Content Weights	100
Style Weights	0.01



Content Loss	Style Loss	Total Loss
190,000	100,000	290,000

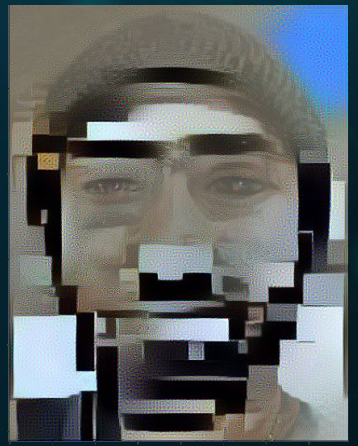
Out of the Box Model (1,000 Iterations)

Optimizer	ADAM
Alpha (LR)	5
Beta	0.99
Epsilon	0.1
Content Weights	100
Style Weights	0.01

Content Loss	Style Loss	Total Loss
800,000	1,500,000	2,300,000

Out of the Box Model (10,000 Iterations)

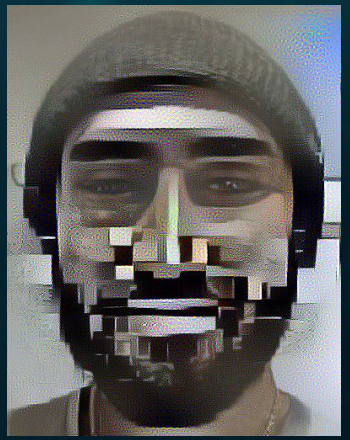
Optimizer	ADAM
Alpha (LR)	5
Beta	0.99
Epsilon	0.1
Content Weights	100
Style Weights	0.01



Content Loss	Style Loss	Total Loss
550,000	300,000	850,000

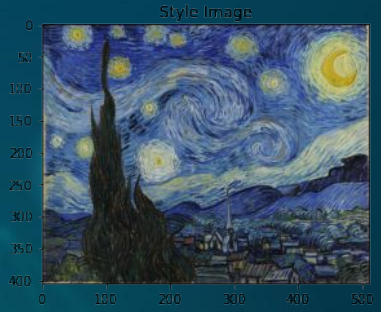
Best Model (10,000 Iterations)

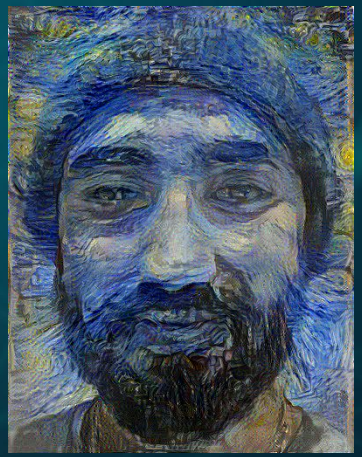
Optimizer	ADAM
Alpha (LR)	5
Beta	0.99
Epsilon	0.1
Content Weights	10
Style Weights	0.001

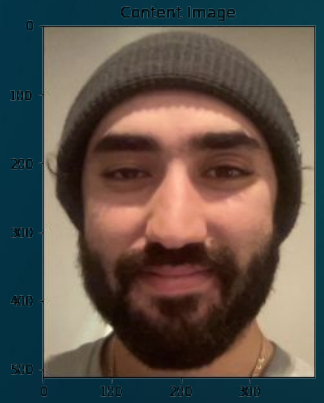


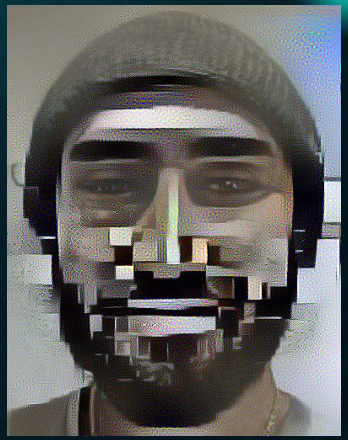
Content Loss	Style Loss	Total Loss
25,000	17,000	42,000

Final Outputs









Future Work

04

Continue testing combinations of weights and learning rate

Try other Optimizers, such as L-BFGS

Sample other model architectures, both size and layer types

Try other models, such as Neural Image Analogies

THANKS!

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