

Edge-to-Image Translation of Shoes

SIC AI 603

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Team Members



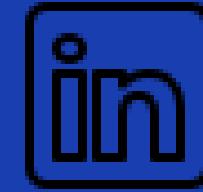
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Agenda

- | Introduction
- | About the Data
- | General Business Insights
- | Data Preprocessing
- | Model Architecture (cGAN)
- | Stable Diffusion
- | Deployment

Edge-to-Image Translation of Shoes Using Conditional GANS

This project uses Conditional GANs with the Edges2Shoes dataset to convert shoe outlines into realistic images. The model learns to generate detailed and high-quality shoe visuals from edge inputs, with potential applications in virtual try-ons, product design, and fashion e-commerce.



About the Data

About the Data

Edges2shoes dataset consists of 50,025 shoe images and their corresponding edges split into train and test subsets..

image num 1
shape(256, 512, 3)



image num 2
shape(256, 512, 3)



image num 3
shape(256, 512, 3)



image num 4
shape(256, 512, 3)



image num 5
shape(256, 512, 3)



General Business Insights



E-commerce Virtual Try-On

Generating realistic images from sketches can help e-commerce platforms enable virtual try-on features, allowing users to visualize shoes based on custom designs or sketch-based input, enhancing customer engagement.

Product Design and Customization

Retailers can provide customers with tools to design their own footwear, which can then be converted into realistic images using your model.

This can streamline product design, allowing companies to gather customer preferences and develop tailored products quickly.

Rapid Prototyping for Designers

Shoe designers can visualize their sketches quickly and in detail, speeding up the prototyping phase.

This capability could also support iterative design, enabling quick adjustments and client approval.

Creative Marketing and Social Media Content

Companies can use sketch-to-image models for creating stylized content, showing the "evolution" from concept sketches to finished products, which can be particularly appealing on social media.

Market Testing for Concept Ideas

By generating realistic shoe images from simple sketches, businesses can test design ideas or trends before production.

This approach can save costs by gauging customer interest early through visual A/B testing or surveys.

Data Preprocessing

DATA PREPROCESSING

Splitting Images into Input and Target

Input Image 1
Shape: (256, 256, 3)



Input Image 2
Shape: (256, 256, 3)



Input Image 3
Shape: (256, 256, 3)



Input Image 4
Shape: (256, 256, 3)



Input Image 5
Shape: (256, 256, 3)



Target Image 1
Shape: (256, 256, 3)



Target Image 2
Shape: (256, 256, 3)



Target Image 3
Shape: (256, 256, 3)



Target Image 4
Shape: (256, 256, 3)



Target Image 5
Shape: (256, 256, 3)



DATA PREPROCESSING

Normalize images

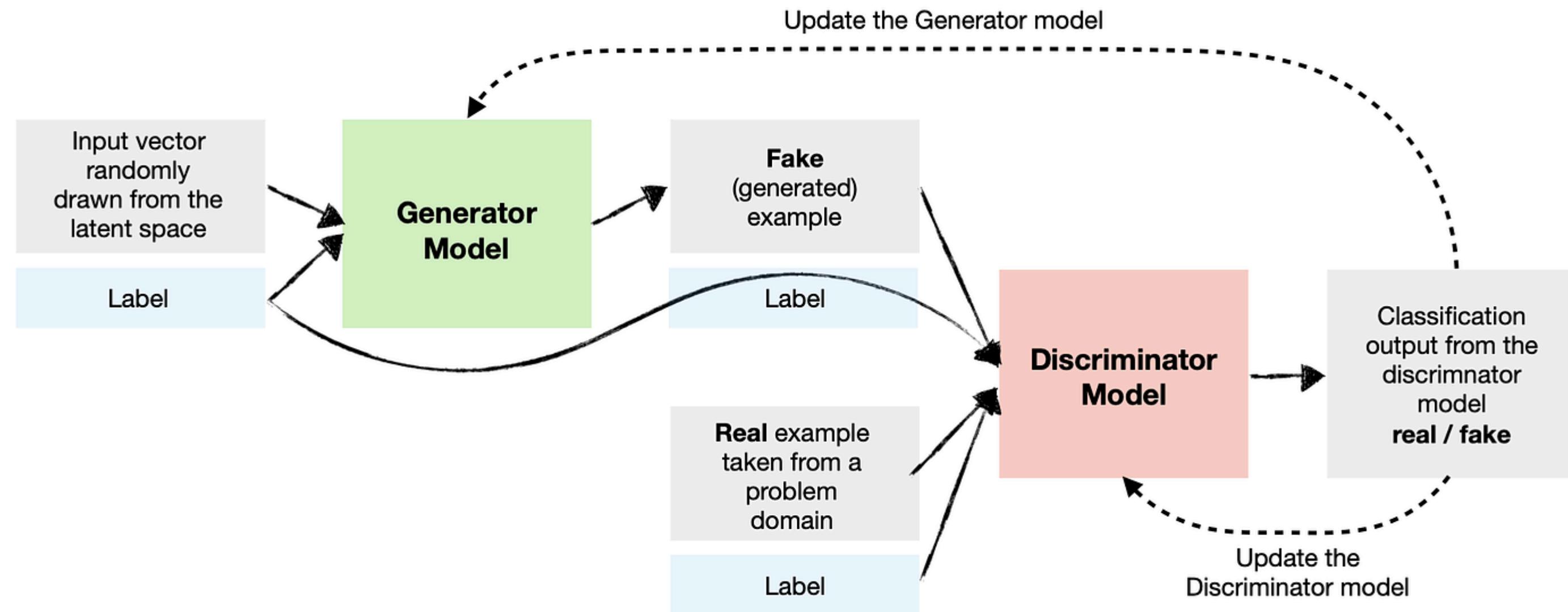
Input Image (Index 0):
Maximum Pixel Value: 1.0
Minimum Pixel Value: -1.0

Target Image (Index 0):
Maximum Pixel Value: 1.0
Minimum Pixel Value: -1.0

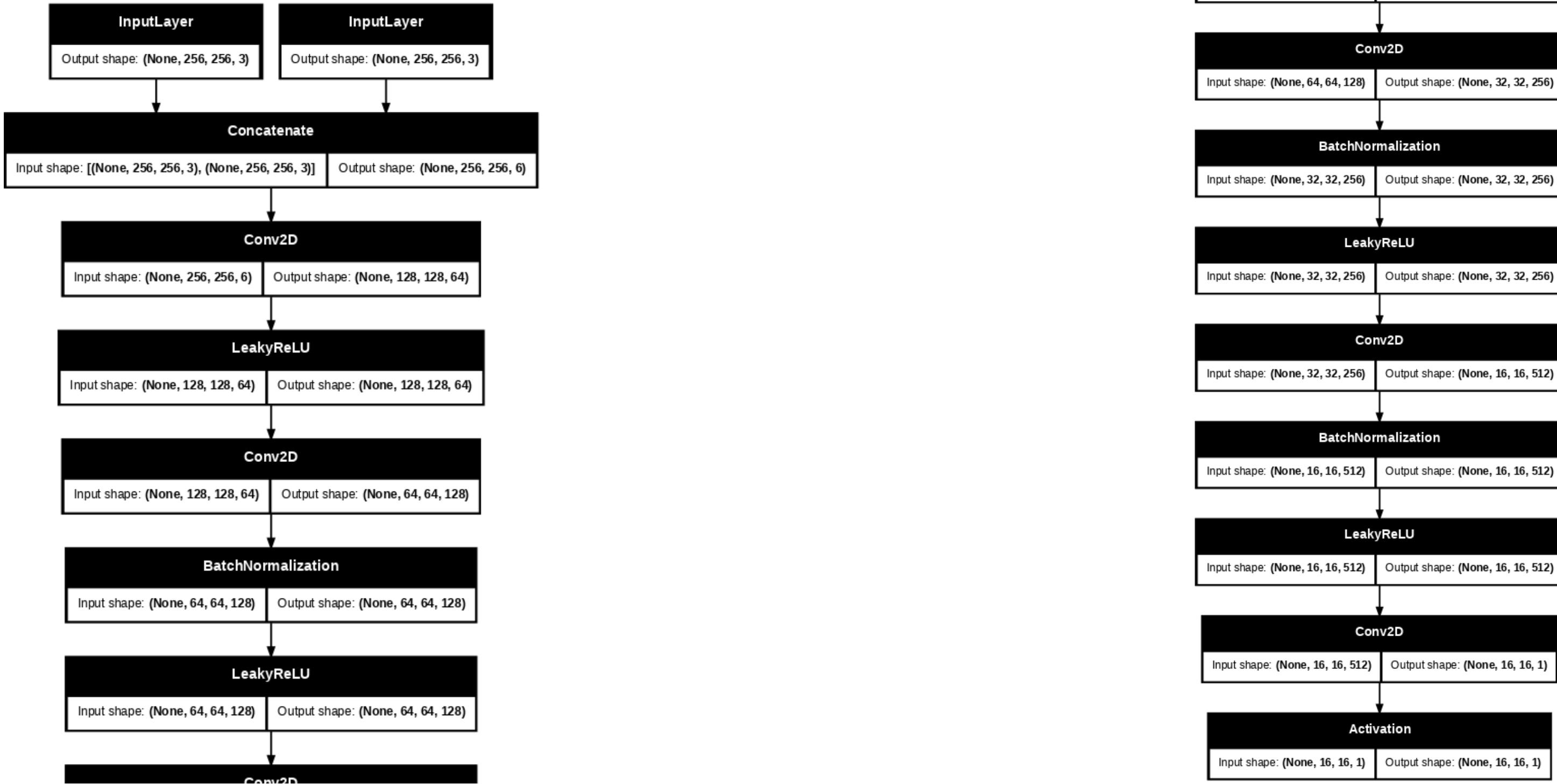
- I normalized Data to this Range [-1,1] not [0,1] , to fit tanh fuunction (in Generator) that produces outputs between -1,1.

Model Architecture

Conditional Gan

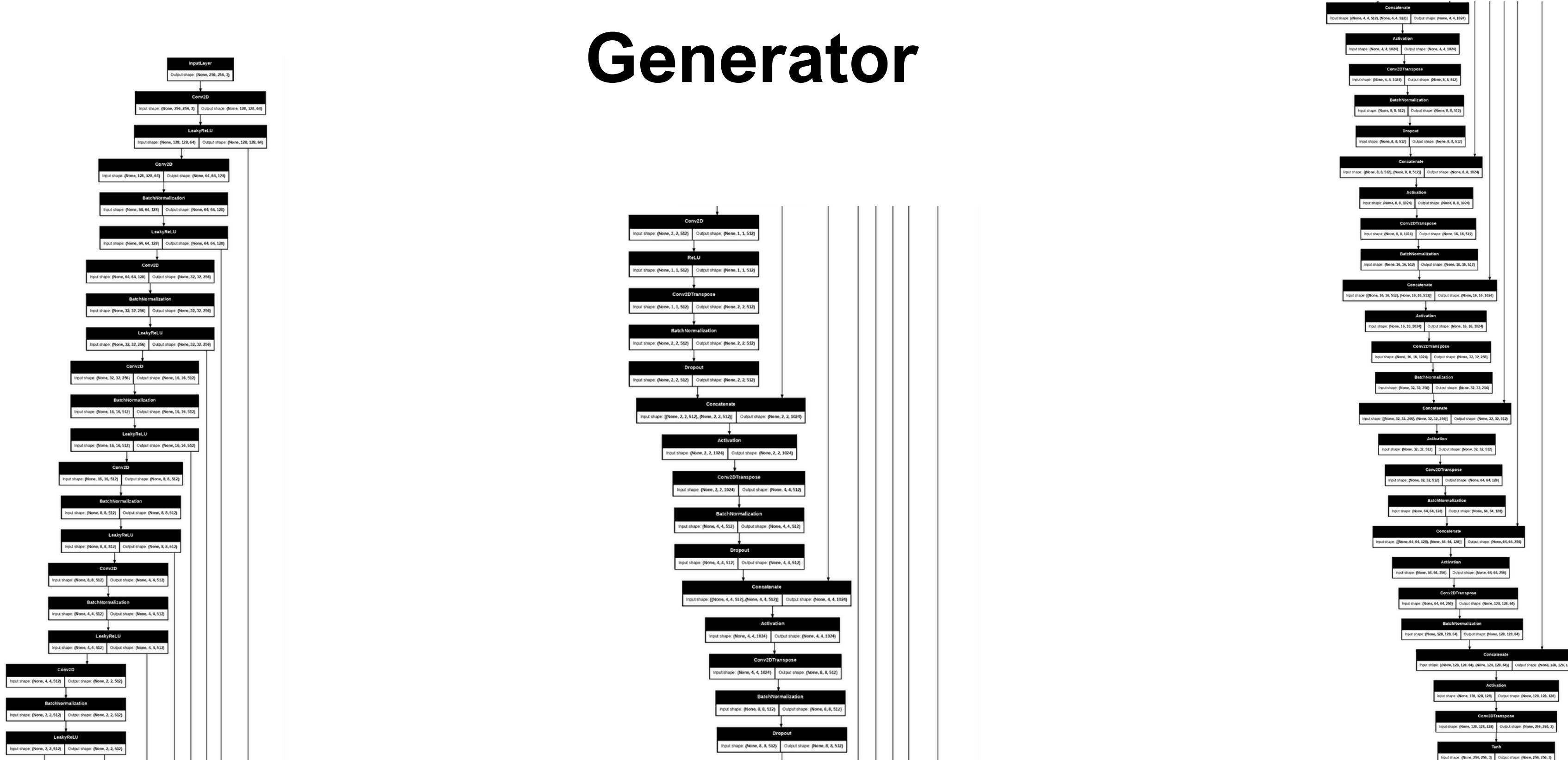


Descriminator



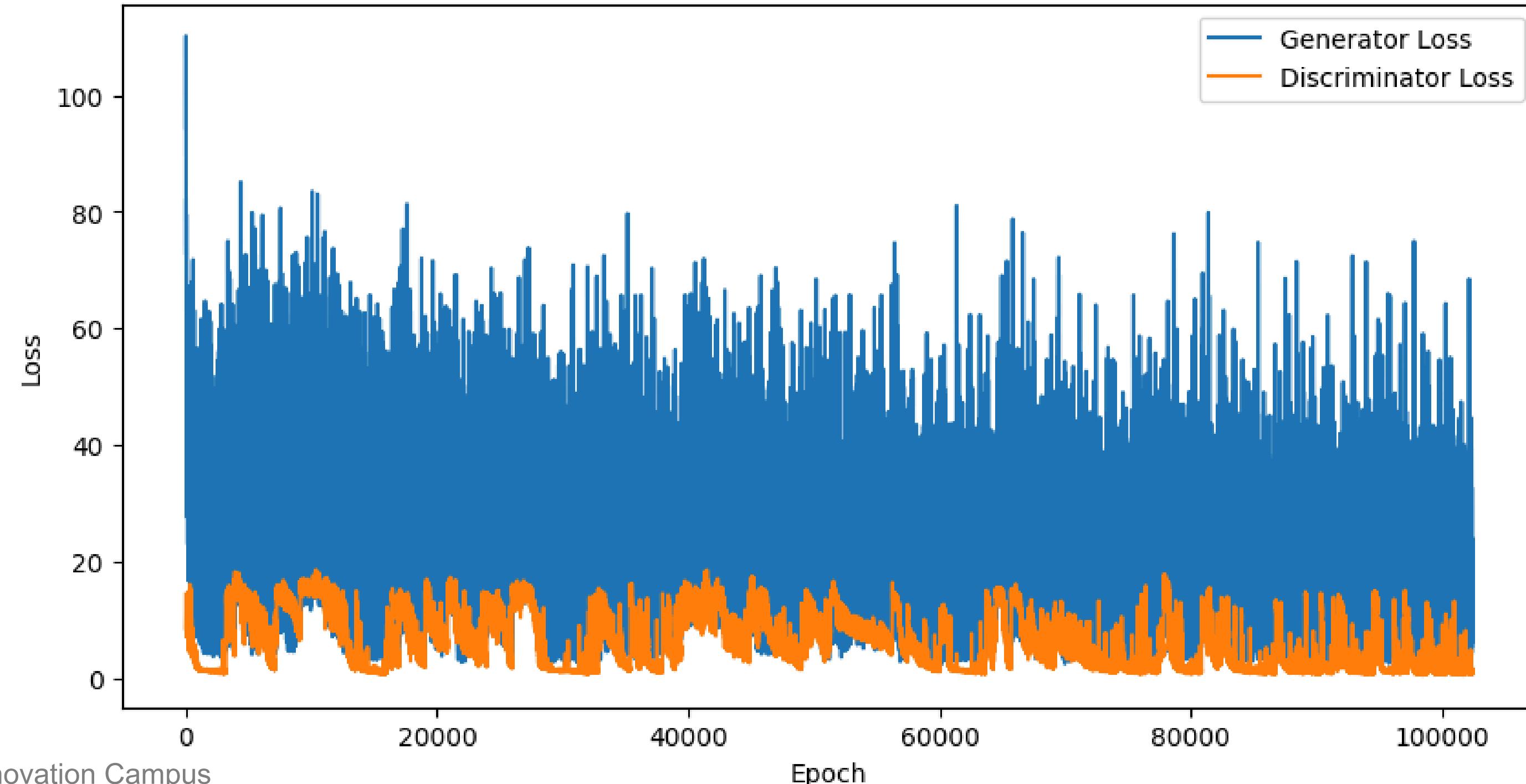
Modeling

Generator

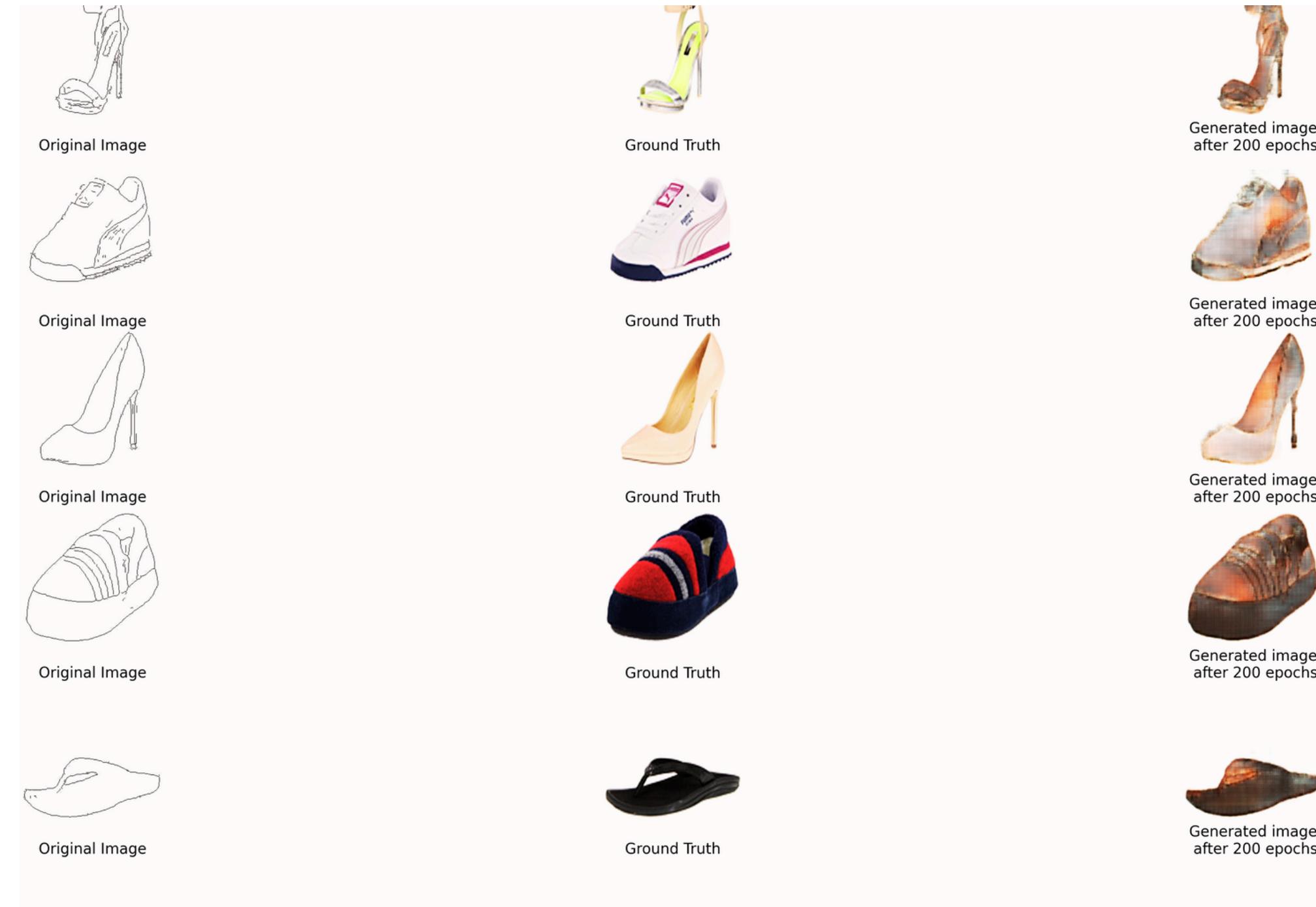


Losses

Generator and Discriminator Loss over Epochs

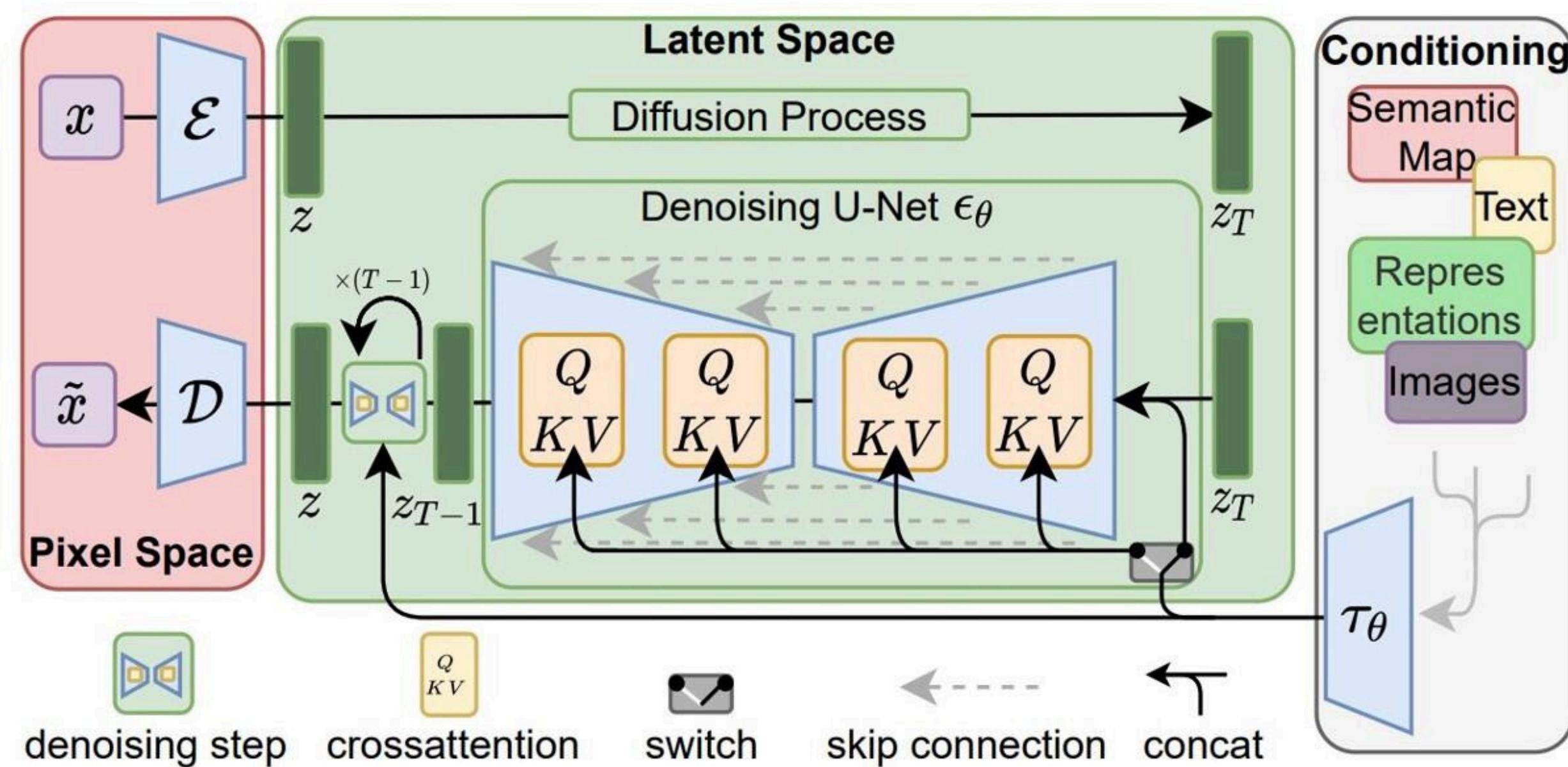


Output Samples



Stable Diffusion

Stable Diffusion Architecture



Deployment

Deployment

Deployment

Design Your Shoes

Generate from Sketch

Choose File OIP.jpeg

Generate from Sketch

Generate from Prompt

Minimalist line art of a class

Generate from Prompt

Generated Images:

Uploaded Sketch



Generated by Generator Model



Generated by Stable Diffusion



Thank You!

OUR NOTEBOOK

SAMSUNG

Together for Tomorrow! Enabling People

Education for Future Generations

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