

Painting with Generative Adversarial Networks: Generating Monet-Style Images Using Novel Techniques

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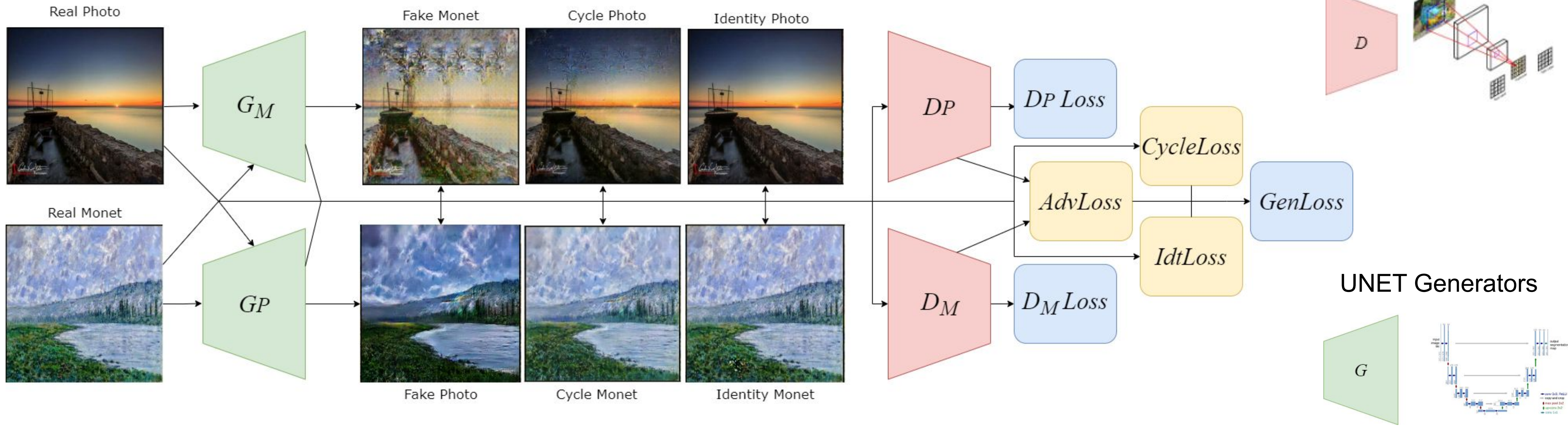
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Initial Architecture: LS DC CycleGAN

Dataset: Kaggle's "I'm Something of a Painter Myself." Contains 300 Monet Paintings and 7028 Photos



Introduce Complexities: Data Pre-Processing, Parameter Tuning, and ResNet Generator

Augment Data
before training

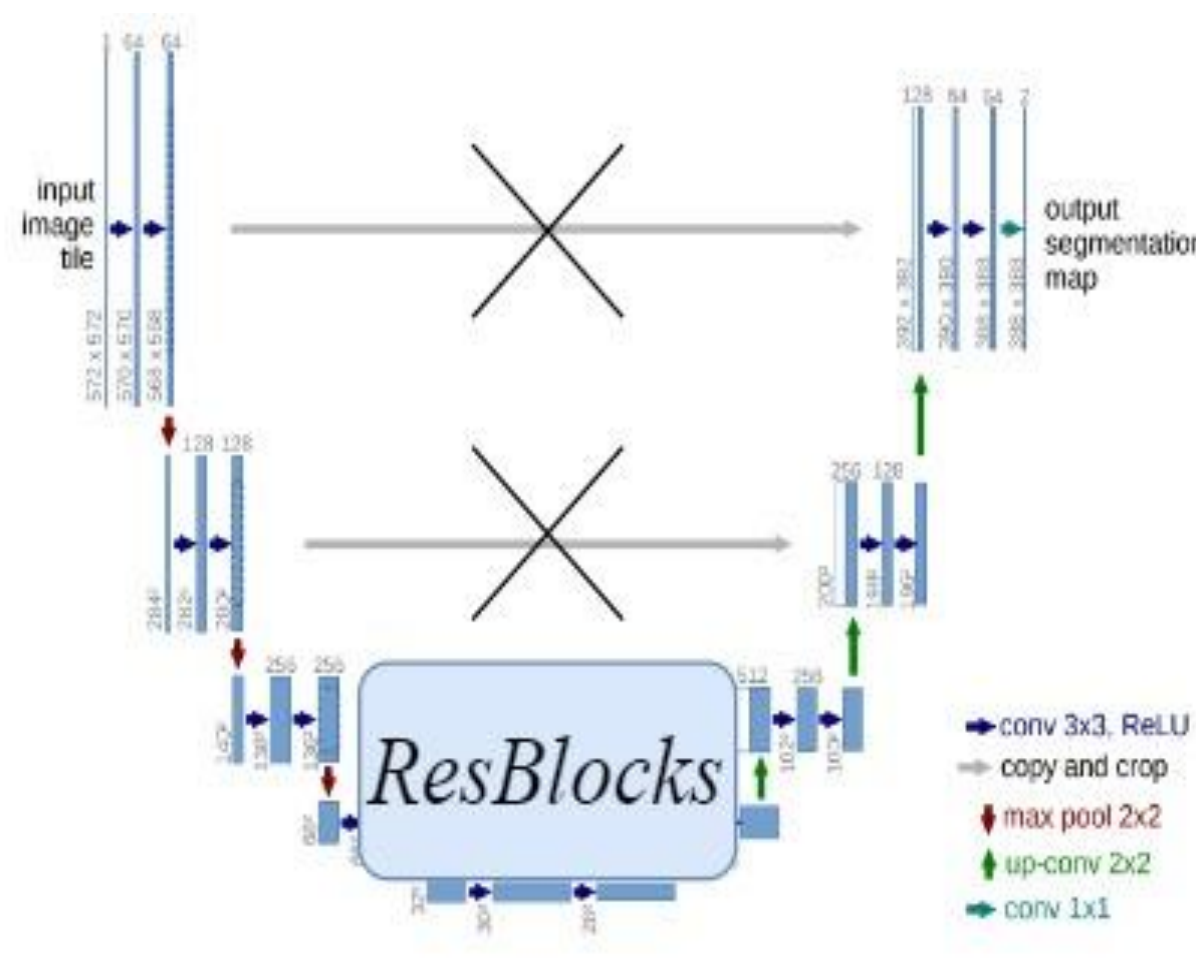
Monet - Augmented Monet



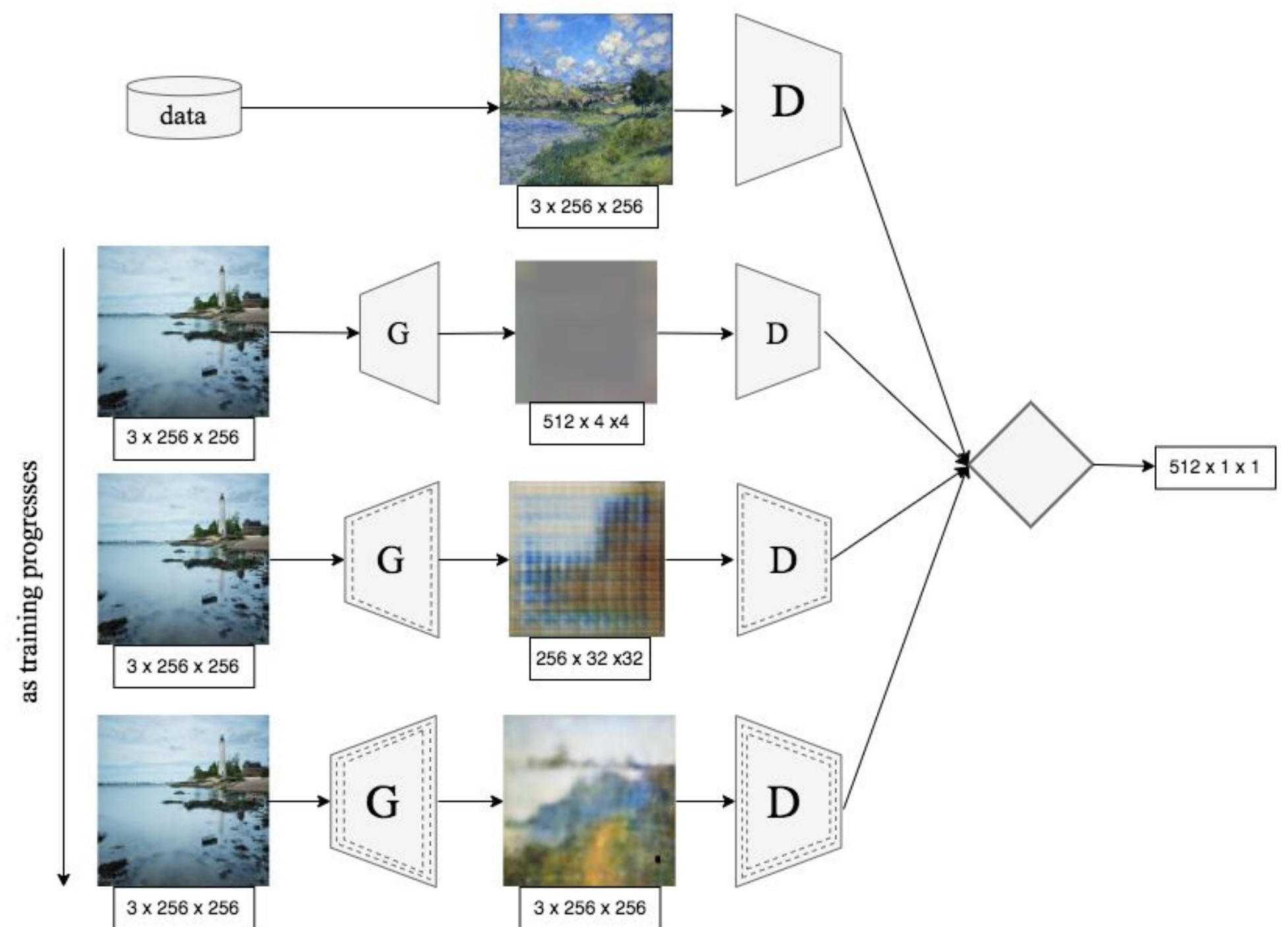
Photo - Augmented Photo



ResNet Generator: Replace
long-skip connections from
UNET with Residual Blocks



Industry Architecture: Progressive Growth Mechanism based on Nvidia StyleGAN with truncation (hyper-realistic for HYPE evaluation)



A New Architecture: LS-DC-D2 CycleGAN with DiffAug

With only 300 Monet Paintings, our Monet Discriminator can memorize the dataset leading to overfitting and decreased performance. To combat this we implement Differentiable Augmentation with a Dual Discriminator (D2).

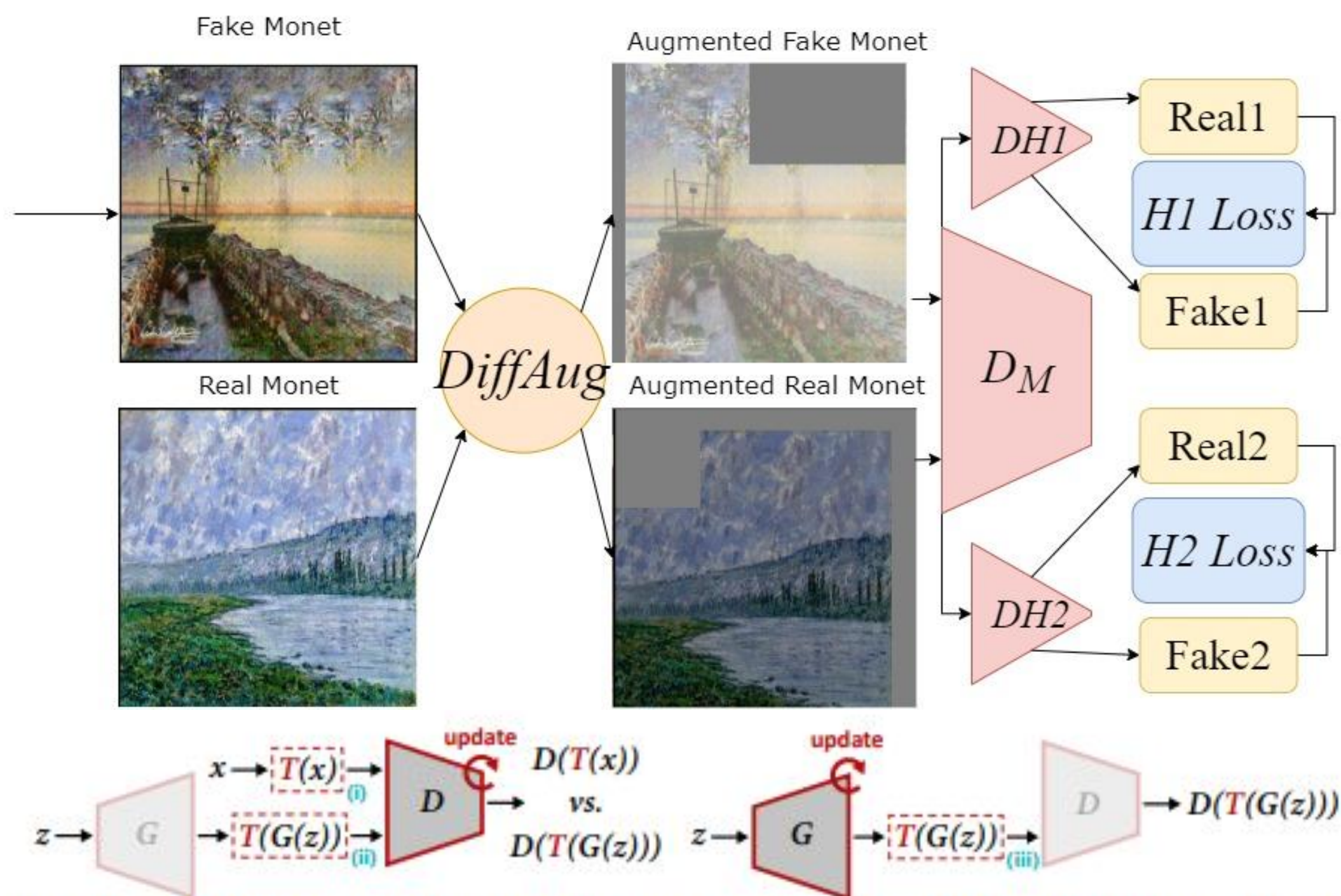


Figure 4: Overview of DiffAugment for updating D (left) and G (right). DiffAugment applies the augmentation T to both the real samples x and the generated output $G(z)$. When we update G , gradients need to be back-propagated through T , which requires T to be differentiable w.r.t. the input.

Results: Evaluation and Output

Generation results after training and Memorization-Informed Fréchet Inception Distance (MiFID) scores for competition submissions

