



Semester: VIII

Subject: Advanced AI
Module 2

Academic Year:2024-2025

GAN applications in image synthesis and style transfer:

1. Image Generation:

GANs can generate new images with diverse content, allowing artists and designers to create unique visuals for various purposes, including advertisements, virtual environments, and digital media.

2. Style Transfer:

GANs can learn the style of a particular image or artist and apply it to other images, resulting in impressive transformations. This technique has been widely used in creating artistic renditions, personalized filters, and augmented reality experiences.

It is the process of taking the style of one image and applying it to another image.

Style transfer was first introduced in 2015 by Gatys et al. They used a neural network to separate the content and style of an image and then recombine them to create a new image.

3. Super-Resolution:

GANs can upscale low-resolution images to higher resolutions, enhancing image quality and enabling better visualization in fields like medical imaging, satellite imagery, and surveillance.

4. Data Augmentation:

GANs can generate synthetic data to supplement training datasets, boosting the performance of machine learning models. This is particularly useful when real data is limited or difficult to obtain, such as in medical imaging or autonomous driving applications.

5. Image-to-Image Translation:

GANs can learn to translate images from one domain to another, such as transforming day to night, changing seasons, or converting sketches to realistic images. These capabilities have implications in entertainment, gaming, virtual reality, and architectural visualization.