Module 11 – Generative AI for Computer Vision - Overview

In this module on “**Generative AI for Computer Vision”**, we explored how generative models like GANs (Generative Adversarial Networks) and VAEs (Variational Autoencoders) are revolutionizing the field. These models can create new, high-quality images from scratch, enhance image resolution, and even generate realistic video sequences. The slides cover foundational concepts, the architecture of GANs and VAEs, and their applications in generating synthetic data for training, creating art, and improving image quality. Examples include DeepFakes, where GANs are used to create realistic human faces, and super-resolution techniques that enhance low-resolution images. Here are some key points I learned during this module.

* + **Generative Models in Computer Vision**:
* Understanding the role of GANs (Generative Adversarial Networks) and VAEs (Variational Autoencoders).
  + **Creating High-Quality Images**:
* Generating new, high-quality images from scratch.
* Enhancing image resolution using super-resolution techniques.
  + **Architecture and Concepts:**
* Foundational concepts and architecture of GANs and VAEs.
* How these models work to generate realistic images and videos.
  + **Applications of Generative AI:**
* Generating synthetic data for training machine learning models.
* Creating art and realistic human faces (e.g., DeepFakes).
* Improving image quality in various applications.
  + **Practical Examples:**
* DeepFakes: Using GANs to create realistic human faces and other synthetic media.
* Super-resolution techniques: Enhancing low-resolution images to higher quality.
  + **Industry Impact:**
* The transformative effect of generative models on fields like entertainment, security, and image processing.