Good morning, respected panel members and audience. Today we are excited to present our project on Conditional Generative Adversarial Networks, or cGANs. Our model is designed to generate human faces with specific emotions, showcasing the power of deep learning in creative AI applications."

*A Conditional GAN is an advanced type of Generative Adversarial Network where the generator doesn’t just create random images but is conditioned on specific labels. This means we can control the type of output our model generates, such as a happy, sad, or surprised face."*

*"The cGAN consists of two main parts: the* ***Generator****, which creates new images, and the* ***Discriminator****, which evaluates whether the generated image is real or fake. The two networks train together in a competitive process, improving each other over time."*

* **Generator:**
  + Takes random noise and a label (emotion) as input.
  + Generates a new image conditioned on that label.
  + Uses layers like **transposed convolutions** to upsample and create realistic images.
* **Discriminator:**
  + Takes both real and generated images with their labels.
  + Learns to distinguish between actual and fake images.
  + Uses **convolutional layers** to extract features.

*"Our model was trained using a technique called TTUR (Two Time-Scale Update Rule), where we set different learning rates for the Generator and Discriminator. This helps maintain balance in training and prevents mode collapse."*

*lthough our model performs well, there are some challenges we faced:"*

* **Training Time:** cGANs require a large dataset and long training periods.
* **Mode Collapse:** Sometimes, the Generator produces similar images repeatedly instead of generating diverse faces.
* **Data Bias:** The dataset may not be fully diverse, affecting the generalization of generated images.