

DHARUNIKA P R

Final Project





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PROBLEM STATEMENT

Developing a Conditional GAN model for generating images conditioned on age and gender attributes presents several challenges. The goal is to synthesize high-quality images that accurately represent specified age and gender characteristics. Key challenges include effectively conditioning the model, obtaining quality annotated data, capturing age progression, incorporating genderspecific features, and handling uncertainty.



PROJECT OVERVIEW



Objective: Develop a Conditional GAN architecture to generate images conditioned on age and gender attributes for various applications. Approach:

- 1. Collect and preprocess a labeled dataset containing images with age and gender annotations.
- 2. Design and train a Conditional GAN model to synthesize images based on specified age and gender attributes.
- 3. Evaluate model performance using quantitative metrics and qualitative analysis on benchmark datasets.
- 4. Deploy the trained model for practical applications like virtual try-on and age progression analysis

This project aims to advance Conditional GAN technology for age and gender-based image generation, offering potential applications in entertainment, digital art, and age progression analysis



WHO ARE THE END USERS?

End users of Conditional GANs for Age and Gender-Based Image Generation include entertainment, fashion, marketing, healthcare, security, education, social media, and individuals seeking personalized content. These users benefit from applications such as character creation, virtual tryon, targeted advertising, age progression analysis, biometrics, education, social media filters, and customized avatars.

YOUR SOLUTION AND ITS VALUE PROPOSITION

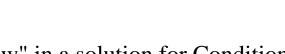


The solution involves developing a Conditional Generative Adversarial Network (GAN) tailored for age and gender-based image generation. This model will be trained on a labeled dataset containing images annotated with age and gender labels. By conditioning the GAN on these attributes during training, it learns to generate realistic images that accurately represent specified age groups and genders.

Value Proposition:

- 1. Customizable Image Generation
- 2. Virtual Try-On and Fashion Design
- 3. Age Progression Analysis
- 4. Targeted Marketing and Advertising
- 5. Biometrics and Security
- 6. Education and Training
- 7. Enhanced Social Media Experience

THE WOW IN YOUR SOLUTION





The "wow" in a solution for Conditional GANs for Age and Gender-Based Image Generation lies in its ability to generate highly realistic images with precise attribute control, including age and gender, while ensuring ethical considerations are met. Additionally, scalability, efficiency, and cross-domain generalization further enhance its impact and usability.

MODELLING

Modeling for Conditional GANs for Age and Gender-Based Image Generation involves designing neural network architectures for both generator and discriminator, incorporating conditional input representation (e.g., one-hot encoded vectors), defining appropriate loss functions for training (e.g., generator maximizing discriminator's probability of classifying generated images as real), and considering ethical implications such as dataset diversity and fairness. Training involves alternating optimization of generator and discriminator, with evaluation metrics like Inception Score used for validation and fine-tuning.

RESULTS

Results for Conditional GANs for Age and Gender-Based Image Generation typically include:

High-Quality Image Generation: The model can produce realistic images of faces with accurate age and gender attributes, closely resembling real human faces.

Attribute Control: Users can specify desired age ranges and genders, and the model generates corresponding images with appropriate characteristics.

Diverse Outputs: The model generates a variety of images within the specified attribute categories, capturing different facial expressions, hairstyles, and other features.

Ethical Considerations: Generated images are free from biases, stereotypes, and sensitive content, promoting inclusivity and respect for diversity.

Generalization: The model demonstrates robustness across different datasets and demographics, producing accurate results for various age groups and genders. **Scalability and Efficiency**: The model can generate images efficiently, even with

large datasets, and can be deployed in real-time applications with minimal computational resources.

