

IDEA IGNITE by CODEBYTE

Problem Statement:

Identification of the Face of a Criminal Suspect using a custom fine tuned stable diffusion model with the description of the eyewitness statements.

Description:

Identifying the face of a criminal suspect using our custom fine tuned stable diffusion model based on eyewitness statements is a complex problem that combines the fields of computer vision, natural language processing, and machine learning. The challenge involves creating a realistic and accurate facial image of a criminal from verbal descriptions provided by witnesses, which can be highly subjective and variable.

Impact:

1.Traditional methods of creating facial composites (e.g., sketch artists) rely heavily on the skill of the artist and the accuracy of the witness's memory. Stable Diffusion can potentially generate more precise and detailed facial images, improving the chances of identifying the suspect.

2.Faster and more accurate suspect identification can expedite investigations, leading to quicker apprehension of criminals. This reduces the time and resources spent on investigations.

3.More accurate facial reconstructions can reduce the risk of wrongful accusations and convictions, which are often caused by unreliable eyewitness testimonies.

Why does it need to be solved?

1.Current methods for creating facial composites are often imprecise and subject to human error. They also depend heavily on the availability and skill of sketch artists, which can be a bottleneck in time-sensitive investigations.

2.Eyewitness testimonies can be highly subjective and influenced by various factors such as stress, lighting conditions, and memory decay. Using a Stable Diffusion model to translate these subjective descriptions into objective, detailed images can mitigate these issues.

3.Improving the accuracy of criminal identification has significant social and ethical implications. It can lead to fairer justice systems, protect the rights of individuals, and foster trust in law enforcement agencies.

Related Researches:

Facial Composite Generation from Natural Language Text Descriptions using Stacked Generative Adversarial Networks - Michael Ryan

Key Insights

- Traditional facial composite methods rely on facial recall, leading to low success rates.
- Stacked GANs offer a new approach to facial composite generation using text descriptions.
- GANs have shown promise in generating realistic images, which can be beneficial for facial composites.
- Combining GANs with natural language processing can enhance the ease of use and accuracy of facial composite generation.
- Improving the model by increasing the dimensional vector representation and tweaking hyperparameters can lead to better results.

Forensic face image generation and recognition - ADITHYA VIKRAM, ANUSHA CHANDRASEKARAN, S. K. SRINITHYEE, R. PRIYADHARSINI

Key Insights

- The proposed system aims to address challenges in forensic face recognition by generating suspect images using TL-GAN and comparing them with existing criminal databases using DeepFace algorithms.
- The study highlights the use of GANs for face image generation and the importance of features like face detection, alignment, and normalization in the face recognition process.
- Performance analysis results show the effectiveness of the system in generating human-like face images with a high resemblance to actual faces and in recognizing faces accurately using state-of-the-art models like FaceNet.
- Future work includes expanding the model to generate faces of different races and enhancing the user interface for improved usability.
- The research contributes to advancements in the field of forensic science by proposing a system that automates the process of generating suspect images and matching them with criminal databases.