

A Deep Learning-Based High-Resolution Illusion Poster Generation System Using Large-Scale Image Mosaic Reconstruction from Video Frames

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Abstract

This research presents a deep learning-based system for generating a high-resolution illusion poster using 10,000 images that reconstruct a target image when viewed from a distance. The proposed method utilizes VLC Media Player to convert movies into frames stored as JPEG files and produces nearly 3,000,000 unique images. A hybrid deep learning approach using Convolutional Neural Networks (CNN), AdaptiveAvgPool2d, RGB similarity, and feature matching is proposed for image selection and poster reconstruction. The generated poster produces an optical illusion where individual images are visible at close range, while the original target image becomes visible when zoomed out. The system improves visual accuracy, scalability, and reconstruction quality for large mosaic-based image generation.

Keywords: Illusion Poster, Image Mosaic, Deep Learning, AdaptiveAvgPool2d, VLC Media Player, Feature Matching, RGB Similarity

1. Introduction

The rapid advancement in deep learning and image processing has enabled large-scale visual reconstruction systems. This work focuses on creating an illusion poster using 10,000 images generated from movie frames extracted using VLC Media Player. The proposed system reconstructs a target image when observed from a zoomed-out view.

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2. System Architecture

1. Movie input → 2. VLC frame extraction → 3. JPEG storage → 4. 3,000,000 image generation → 5. CNN feature extraction → 6. AdaptiveAvgPool2d processing → 7. Similarity matching → 8. Tile arrangement → 9. Illusion poster generation

3. Methodology

The proposed methodology first extracts frames from movies using VLC Media Player. Frames are stored as JPEG images and transformed into millions of unique images. 4-pixel squares in input image are given as input to AdaptiveAvgPool2d. This is done for all 4-pixel squares in input image iteratively. Each iteration gives RGB result which is used to get image from collection which contains same RGB average of all pixel in the image from collection. Selected image from collection is added to x, y coordinates of poster.

4. Mathematical Formula

Adaptive Average Pooling Formula:

Iterations = Image pixel count / 4

For each iteration

```
{  
Output (RGB) = Average (4-pixel square in input image)  
Find the image with RGB average = output (RGB)  
}
```

5. Algorithm

Step 1: Load target image

Step 2: Extract movie frames using VLC

Step 3: Store JPEG files

Step 4: Generate unique images info and their metadata in database

Step 5: give input photo to AdaptiveAvgPool2d as input

Step 6: Calculate RGB average of 4-pixel square in given input photo

Step 7: RGB avg for each 4-pixel square, match tile image from collection of 3,000,000

Step 8: if image is not found the take nearest average RGB image and adjust every pixel RGB values of the nearest image. Which will help us to get exact image we want

Step 9: create output image with 23000 *23000 which will work as grid for the selected images from collection

Step 10: fill the poster with 10,000-images

Step 9: Generate illusion output

6. Advantages

Energy efficient compared to image generation by LLM

High reconstruction quality

Scalable to millions of images

Deep learning-based accuracy

Efficient feature matching

High-resolution illusion generation

7. Results

Experimental evaluation shows that the proposed system successfully reconstructs the target image using 10,000 images. The zoom-out illusion effect is visually effective while maintaining high detail at close view.

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8. Conclusion and Future Scope

The proposed deep learning framework successfully generates illusion posters using image mosaics. Future work can improve real-time generation and integrate transformer-based visual feature extraction.

Sample Poster: -

