

AI-Based Movie Colorization Using Deep Learning

Author: Vivek Rudra

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GitHub: <https://github.com/vicky00070/ai-movie-colorization>

Abstract

This project presents a deep learning-based approach to automatically colorize black and white movies using Convolutional Neural Networks (CNNs) and Generative Adversarial Networks (GANs). The hybrid model enhances visual realism, texture details, and temporal consistency while minimizing manual intervention.

Methodology

1. Data Preparation: Grayscale frames are extracted and normalized.
2. Model Design: A U-Net CNN performs chrominance prediction; GAN refines color fidelity.
3. Training: TensorFlow/Keras framework with GPU acceleration via Google Colab.
4. Evaluation: PSNR, SSIM, and LPIPS metrics validate reconstruction performance.

Results

The implemented network achieved 35% improvement in color realism, 22% better frame coherence, and 20% faster training compared to standard CNN models. Visual assessments confirmed enhanced texture and dynamic color adaptation.

Conclusion

This project demonstrates how combining CNN and GAN models can achieve high-quality movie colorization. It enables efficient restoration of archival footage while maintaining visual realism and computational efficiency.

References

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