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REVIEWER'S REPORT

Manuscript No.: IJAR-59617

Title: Using a pre-trained neural network (VGG16) to solve the image style transfer problem.

Recommendation:
Accept as it is .....
Accept after minor revision.....
Accept after major revision ...✓.....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity			✓	
Significance			✓	

Reviewer's ID: JPR-098

Detailed Reviewer's Report

Decision: Accept after Major Revision

Major Revisions

1. Novelty and Research Contribution: The manuscript proposes a VGG16-based image style transfer method, but the originality of the proposed approach is not sufficiently established. The authors should clearly explain how their method differs from existing neural style transfer techniques and identify its specific technical contributions.

2. Methodological Clarity: The proposed methodology is not explained in sufficient detail. The authors should provide a systematic description of the complete image style transfer process, including feature extraction, content representation, style representation, loss calculation, and image optimization.

3. Justification for VGG16 Selection: The authors should provide a stronger justification for selecting VGG16 instead of other established architectures, such as VGG19, ResNet, or more recent convolutional neural networks. A comparative explanation of feature extraction capabilities would strengthen the methodology.

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4. Dataset and Image Selection: The experimental evaluation primarily demonstrates style transfer using a parrot image and a reference style image. The authors should provide additional experiments using diverse content and style images to establish the general applicability and robustness of the proposed method.

5. Insufficient Experimental Evaluation: The manuscript does not provide sufficient quantitative evaluation of the generated images. The authors should incorporate appropriate image quality and perceptual similarity metrics, such as SSIM, PSNR, and LPIPS, where appropriate, to support the effectiveness of the proposed method.

6. Loss Function Formulation: The content loss and style loss functions require a more detailed mathematical explanation. The authors should clearly define the mathematical formulation, weighting coefficients, selected VGG16 layers, and optimization objective used for generating the stylized image.

7. Gram Matrix Computation: The role of the Gram matrix in representing style characteristics is not sufficiently explained. The authors should provide detailed mathematical derivations and clarify how feature correlations are calculated across different convolutional layers.

8. Comparative Performance Analysis: The manuscript does not compare the proposed approach with established neural style transfer methods. The authors should compare its performance with existing approaches to demonstrate improvements in visual quality, processing time, and computational efficiency.

9. Training and Optimization Parameters: Important implementation details, including optimizer selection, learning rate, image dimensions, loss weights, and stopping criteria, are insufficiently reported. These parameters should be clearly specified to ensure reproducibility.

10. Interpretation of Experimental Results: The manuscript reports content and style errors after 600 training epochs but does not adequately explain their significance. The authors should provide a detailed analysis of the loss convergence, visual quality, and relationship between the reported numerical errors and the final generated image.

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Minor Revision Comments

1. Title: The title should be refined to clearly indicate the specific contribution of the proposed VGG16-based image style transfer technique.

2. Abstract: The abstract should be rewritten to include the research objective, proposed methodology, experimental setup, key quantitative findings, and major contribution.

3. Keywords: The keywords should be revised to better represent the manuscript. Suggested terms include Neural Style Transfer, VGG16, Transfer Learning, Deep Feature Extraction, and Gram Matrix.

4. Introduction: The introduction should be strengthened with a clearer explanation of the research problem, motivation, and limitations of existing image style transfer methods.

5. Literature Review: The authors should include more recent research publications on neural style transfer, deep feature representations, and transfer learning.

6. VGG16 Architecture: The explanation of VGG16 should be made more concise and technically accurate. The authors should clearly identify the convolutional layers used for content and style feature extraction.

7. Figures and Captions: Figures 1–8 should be improved for readability, resolution, and consistency. Each figure should have a descriptive caption and be properly discussed in the manuscript.

8. Mathematical Notation: All equations should be consistently formatted and numbered. The symbols, variables, and parameters used in the equations should be explained immediately after their introduction.

9. Language and Grammar: The manuscript requires comprehensive English language editing. Several sentences contain grammatical issues, unclear expressions, and inconsistent technical terminology.

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10. References: The reference list should be updated with recent and relevant publications. The formatting should be made consistent, and all references should be properly cited within the manuscript.