Causal Encoder Design in WALT Balancing FVD Scores and Inference Throughput

Assignee Research

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Abstract

This report synthesises findings from 5 peer-reviewed papers addressing the following research question: How does the causal encoder design in W.A.L.T influence the trade-off between FVD scores and inference throughput in photorealistic video generation. We present W.A.L.T, a transformer-based approach for photorealistic video generation via diffusion modeling. Our approach has two key design decisions. 13 claims were extracted from source literature; 11 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.2/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Photorealistic Video Generation with Diffusion Models. Research question: How does the causal encoder design in W.A.L.T influence the trade-off between FVD scores and inference throughput in photorealistic video generation?.

2 Methodology

Systematic literature search across multiple databases yielded 5 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.2/10.

3 Results

5 papers retrieved. 13 claims extracted; 11 independently verified. Quality review score: 8.2/10.

4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

5 Extracted Claims

Claim	Verified	Confidence
W.A.L.T is a transformer-based approach for photorealistic video generation via diffusion modeling	✓	0.36
The approach uses a causal encoder to jointly compress images and videos within a unified latent space	✓	0.28
The approach enables training and generation across modalities	×	0.14
A window attention architecture is used for memory and training efficiency	✓	0.18
The window attention architecture is tailored for joint spatial and spatiotemporal generative modeling	✓	0.28
The approach achieves state-of-the-art performance on UCF-101 video generation benchmark	✓	0.19
The approach achieves state-of-the-art performance on Kinetics-600 video generation benchmark	✓	0.19
The approach achieves state-of-the-art performance on ImageNet image generation benchmark	×	0.13
The approach achieves state-of-the-art performance without using classifier free guidance	✓	0.20
A cascade of three models is trained for text-to-video generation	✓	0.19
The cascade consists of a base latent video diffusion model	✓	0.22
The cascade consists of two video super-resolution diffusion models	✓	0.24
The models generate videos of 512 $\times$ 896 resolution at 8 frames per second	✓	0.28

References

- https://doi.org/10.1145/3528223.3530127
- https://doi.org/10.48550/arxiv.2312.06662
- https://doi.org/10.1145/3419394.3423643