Work-let Name: Develop a Quality Assurance framework for Video Generation Models

Worklet Details

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KPIs achieved till now

- We had looked for various metrics and datasets that can be used for quality assurance of video generation models:
- The Fréchet Inception Score represents an advancement over the Inception Score, achieved through feature extraction, mean and covariance analysis, evaluating realism and perceptual similarity index.
- PSNR (Peak Signal-to-Noise Ratio)
- SSIM (Structural Similarity Index Measure)
- VMAF(Video Multimethod Assessment Fusion)
- FVD (Fréchet Video Distance)
- Looked at SOTA benchmarks for video generation and their respective datasets.

Any Challenges/ Issues faced

- Finding uniform metric for evaluation as different video generation frameworks employ varied approaches to model motion.
- How video generation models handle the incorporation of spatio-temporal dynamics.
- Finding benchmark datasets for evaluation.
- Limited metrics available for purely video generation.
- Human preference mass surveys and the Inception Score, while prevalent, often fail to adequately handle corner cases in the video domain during evaluation.
- Should we look for full reference metrics?

Next Steps

After finalising the evaluation metrics and datasets we look to move forward to design phase.

Key Achievements/ Outcome till now

Came to a conclusion on the list of parameters for the evaluation metrics.

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References

- VMAF Metric https://netflixtechblog.com/toward-a-practical-perceptual-video-quality-metric-653f208b9652
- Pros and Cons of GAN Evaluation Measures 1802.03446.pdf (arxiv.org)
- On Evaluating Video-based Generative Adversarial Networks (GANs) On Evaluating Video-based Generative Adversarial Networks (GANs) | IEEE Conference Publication | IEEE Xplore
- Fréchet Video Distance https://arxiv.org/abs/1812.0171
- The Power of Generative AI: A Review of Requirements, Models, Input–Output Formats, Evaluation Metrics, and Challenges (1) (PDF) The Power of Generative AI: A Review of Requirements, Models, Input–Output Formats, Evaluation Metrics, and Challenges (researchgate.net)

Last month progress

- We had reviewed papers stating different models of video generation.
- They had used different metrics to evaluate a video.