

A Rule-Based Analytical Framework for Green AI-Driven Generative Video Evolution in Mobile Learning

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Abstract:

Videos are made in a new way now because of Generative AI. It is possible to turn text into video and use AI to animate it. The editing part can also be done automatically with Generative AI. However these methods can be very slow for computers are not good for the environment. This is because they need a lot of power to work and to learn. We have made a system to check and improve video models. Our system is based on rules and we are focusing on making Generative AI greener which means it will be better, for the environment and use less power. We are using Green AI concepts to do this. We look at designs like Diffusion Transformers and Video Variational Autoencoders. We also look at methods that do not use classifiers for guidance. Diffusion Transformers and Video Variational Autoencoders are important. We want to know how energy they use and how bad they are, for the environment. Our system creates ways to measure how money and energy these things cost. We also look at how they affect the earth. Diffusion Transformers and Video Variational Autoencoders are tested on three tools: OpenAIs Sora, Runways Gen-2 and Pika Labs. In structured experiments using standard text-to-video tests, we demonstrate that this system identifies setup adjustments that cut energy use by up to 35% without dropping perceived quality by more than 5%. These results reveal key compromises between model accuracy and eco-friendliness, giving useful advice to those in the field. By offering a structured method to weigh generative capabilities against environmental care, our work fills an important void in prior studies, helping build video generation systems that are more sustainable.

Keywords:

Generative AI, Text-to-Video Generation, Video Diffusion Models, Diffusion Transformer, Green AI, Energy Efficiency, Carbon Footprint, Sustainable Computing, Video VAE, Classifier-Free Guidance.