Submission Summary

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International Conference on Information Systems and Computer Networks (ISCON 2025)

Track Name
Artificial Intelligence, Machine Learning and Information Retrieval

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47

Paper Title
Text-to-Image Generation Using AI and Machine Learning

Abstract
Text-to-image generation has gained significant attention in artificial intelligence, enabling machines to create visual representations from textual descriptions. This paper explores the advancements in text-to-image synthesis, leveraging deep learning models to generate realistic images based on textual input. Traditional methods struggled with semantic alignment, often producing unrealistic outputs. However, recent breakthroughs in Generative Adversarial Networks (GANs), attention mechanisms, and diffusion models have significantly improved image quality and contextual accuracy.

This study builds upon previous work by integrating a pretrained dataset with fine-tuning techniques to enhance image generation quality. We compare our approach with existing models such as StackGAN, AttnGAN, DALL-E, and Stable Diffusion, analyzing performance in terms of image fidelity, computational efficiency, and semantic coherence. Our findings indicate that while our method achieves superior computational efficiency and improved text-image alignment, it still faces challenges with highly abstract text prompts.

The proposed model utilizes an optimized training strategy, reducing inference time while maintaining high-resolution output. The research highlights the potential applications of text-to-image generation in content creation, design automation, and AI-assisted creativity. Future enhancements include incorporating reinforcement learning for further refinement and exploring hybrid architectures that merge GANs and diffusion models to achieve superior results.

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