AI-Powered Image Generation using Stable Diffusion

Objective

To build an AI-powered text-to-image generation tool using the Stable Diffusion model, enabling the transformation of textual prompts into high-quality images.

Tools & Libraries

- diffusers

- torch

- PIL (Python Imaging Library)

- datetime, os

Execution Flow

1. Load pretrained Stable Diffusion model using diffusers.

2. Accept user input prompts.

3. Generate image corresponding to the input prompt.

4. Display the image.

5. Save the image in a local directory 'generated_images/'.

6. Exit on 'exit' command.

Hardware Requirements

This script can run on both CPU and GPU. For faster image generation and better performance, GPU (CUDA support) is recommended.

Output

Images are generated from user prompts and saved in the 'generated_images' directory.

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Usage

Run the script, enter any descriptive prompt, and view the generated image. Type 'exit' to quit.

Future Scope

- Implement a web-based UI for broader accessibility.

- Add GPU support for faster inference.

- Enable prompt refinement and negative prompts.

- Allow saving metadata with images.

Skills Demonstrated

- Python scripting

- Deploying pretrained AI models

- Real-time user input handling

- Image processing and file I/O

- Working with open-source libraries