Project: "Text-to-Image Generator with Stable Diffusion"

Utilize pre-trained generative models like DALL-E-mini or Stable Diffusion to create images from text prompts.

In this example, let’s focus on using Stable Diffusion via the popular diffusers library from Hugging Face, which simplifies working with such models.

Project Overview

Set up Environment

```
!pip install torch diffusers transformers pillow
```

```
Requirement already satisfied: torch in c:\users\sarav\anaconda3\lib\site-packages (2
Collecting diffusers
  Obtaining dependency information for diffusers from https://files.pythonhosted.org/
  Downloading diffusers-0.30.3-py3-none-any.whl.metadata (18 kB)
Requirement already satisfied: transformers in c:\users\sarav\anaconda3\lib\site-pack
Requirement already satisfied: pillow in c:\users\sarav\anaconda3\lib\site-packages (
Requirement already satisfied: filelock in c:\users\sarav\anaconda3\lib\site-packages
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Requirement already satisfied: certifi>=2017.4.17 in c:\users\sarav\anaconda3\lib\sit
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Installing collected packages: diffusers
Successfully installed diffusers-0.30.3
```

Import Libraries

```
from diffusers import StableDiffusionPipeline
import torch
from PIL import Image
```

```
WARNING:tensorflow:From C:\Users\Sarav\anaconda3\Lib\site-packages\keras\src\losses.p

C:\Users\Sarav\anaconda3\Lib\site-packages\transformers\utils\generic.py:260: FutureW
  torch.utils._pytree._register_pytree_node(
C:\Users\Sarav\anaconda3\Lib\site-packages\transformers\utils\generic.py:260: FutureW
  torch.utils._pytree._register_pytree_node(
```

Load the Stable Diffusion Model

```
# Load the pre-trained Stable Diffusion model from Hugging Face
model_id = "CompVis/stable-diffusion-v1-4"
device = "cuda" if torch.cuda.is_available() else "cpu"

# Initialize the pipeline
pipe = StableDiffusionPipeline.from_pretrained(model_id)
pipe = pipe.to(device)
```

```
model_index.json:   0%|          | 0.00/541 [00:00<?, ?B/s]
C:\Users\Sarav\anaconda3\Lib\site-packages\huggingface_hub\file_download.py:147: User
To support symlinks on Windows, you either need to activate Developer Mode or to run
  warnings.warn(message)
Fetching 16 files:   0%|          | 0/16 [00:00<?, ?it/s]
safety_checker/config.json:   0%|          | 0.00/4.56k [00:00<?, ?B/s]
text_encoder/config.json:   0%|          | 0.00/592 [00:00<?, ?B/s]
(…)ature_extractor/preprocessor_config.json:   0%|          | 0.00/342 [00:00<?, ?
B/s]
(…)kpoints/scheduler_config-checkpoint.json:   0%|          | 0.00/209 [00:00<?, ?
B/s]
scheduler/scheduler_config.json:   0%|          | 0.00/313 [00:00<?, ?B/s]
tokenizer/merges.txt:   0%|          | 0.00/525k [00:00<?, ?B/s]
tokenizer/tokenizer_config.json:   0%|          | 0.00/806 [00:00<?, ?B/s]
tokenizer/vocab.json:   0%|          | 0.00/1.06M [00:00<?, ?B/s]
unet/config.json:   0%|          | 0.00/743 [00:00<?, ?B/s]
tokenizer/special_tokens_map.json:   0%|          | 0.00/472 [00:00<?, ?B/s]
vae/config.json:   0%|          | 0.00/551 [00:00<?, ?B/s]
model.safetensors:   0%|          | 0.00/492M [00:00<?, ?B/s]
model.safetensors:   0%|          | 0.00/1.22G [00:00<?, ?B/s]
diffusion_pytorch_model.safetensors:   0%|          | 0.00/3.44G [00:00<?, ?B/s]
diffusion_pytorch_model.safetensors:   0%|          | 0.00/335M [00:00<?, ?B/s]
Loading pipeline components...:   0%|          | 0/7 [00:00<?, ?it/s]
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Generate Image from Text

```
def generate_image(prompt, image_size=(512, 512)):
    # Generate an image from the text prompt
    with torch.autocast(device):
        image = pipe(prompt)["images"][0]  # Get the generated image
        return image
```

Save or Display the Generated Image

```
def save_image(image, filename="generated_image.png"):
    # Save the image to disk
    image.save(filename)
    print(f"Image saved as {filename}")

def show_image(image):
    # Display the image
    image.show()
```

Main Function to Run the Project

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```
def main():
    # Get text prompt from user
    prompt = input("Enter your text prompt: ")

    # Generate image based on prompt
    generated_image = generate_image(prompt)

    # Save and show the image
    show_image(generated_image)
    save_image(generated_image)

if __name__ == "__main__":
    main()
```

```
Enter your text prompt: CAT AND DOG FIGHTING EACH OTHER
  0%|          | 0/50 [00:00<?, ?it/s]
Image saved as generated_image.png
```