

MSIS 549 Team 12



A Project about Open-Source

# StabilityAI Diffusion Models



# Agenda

- 1 Problem Statement
- 2 Overview of Stability AI
- 3 API and Tools
- 4 Live Demo
- 5 Use Cases
- 6 How to Contribute to Project
- 7 Appendix

# Problem: Closed-Source GenAI Models



**High Costs**



**Limited  
Accessibility**



**Lack of  
Transparency**



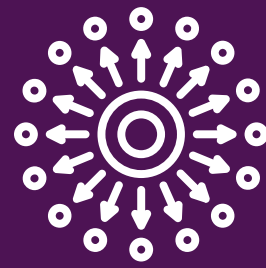
**Lack of Control and  
Customization**

# What is Stability AI?



## Open-Source

Their goal is to **democratize AI**, making **creation of digital** content accessible to everyone. Focus is on building **scalable**, **decentralized**, and **user-friendly** AI systems.



## Stable Diffusion

**Stable Diffusion** - Stability AI's **flagship product**, an open-source **generative adversarial network** that can create **high-quality images** based on **textual input** and vice versa.



## Community

The company heavily promotes **community involvement** in the **development and enhancement** of its technologies.



# API and Tools

**Text-to-Image:** stabilityai/stable-diffusion-xl-base-1.0

**Image-to-Text:** salesforce/blip-image-captioning-large

**API:** Hugging Face

**User Interface:** Gradio UI

stability.ai



Stable Diffusion



Hugging Face



gradio

# Demonstration of Open-Source Model

FileEditSelectionViewGoRunTerminalHelp

511 A

EXPLORER

511 A

flagged

Assignment 1.docx

hashcode.ipynb

project.ipynb

project.ipynb

project.ipynb > ...

+ Code+ Markdown▶ Run All↺ Restart≡ Clear All Outputs📄 Variables≡ Outline...

2image = query(prompt)

3return image

4

5# generate\_image("cat in suit")

[37] ✓ 0.0s

▶

1iface = gr.Interface(  
2    fn=generate\_image,  
3    inputs=gr.Textbox(label="Enter your prompt"),  
4    outputs=gr.Image(label="Generated Image"),  
5    title="Image Generator",  
6    description="Enter a prompt to generate an image using a Stable Diffusion model."  
7)  
8  
9iface.launch(share=False)

✓ 2.2s

Execution Order

local URL: <http://127.0.0.1:7865>

c:\Users\daniy\anaconda3\Lib\site-packages\gradio\analytics.py:98: UserWarning: unable to parse version details from package URL.  
warnings.warn("unable to parse version details from package URL.")

To create a public link, set `share=True` in `launch`.

Image Generator

Enter a prompt to generate an image using a Stable Diffusion model.

PROBLEMSOUTPUTDEBUG CONSOLETERMINALPORTSJUPYTER

Requirement already satisfied: un  
Requirement already satisfied: ce  
PS D:\UW\5. Spring 24\511 A> |

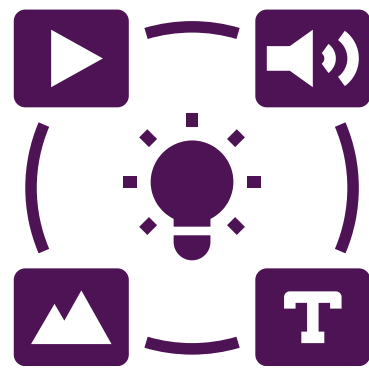
app.clipchamp.com is sharing your screen. Stop sharingHide

packages (from requests) (1.26.16)  
packages (from requests) (2023.5.7)

Spaces: 4CRLFCell 6 of 9Go-Live

12:38 AM  
4/27/2024

# Use Cases in Business



## Digital Creation

**Thumbnail Generation**  
**Concept Art Creation**



## Marketing & Advertising

**Automated Ad Creation**  
**Social Media Content**

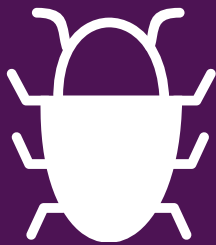


## Education Content

**Educational Materials**  
**Simulation Images**



# Want to Contribute?



**Report/Fix Bugs**



**Review/Fix Code**



**Improve UI/UX**



**Improve  
Documentation**



**Participate in  
Discussions**



**Educate Others**



**Donate**

# Appendix

# Our Code



<https://colab.research.google.com/drive/16PtQvJjFhGXQx1mXFBXyWYlkoQWRcEnf?usp=sharing>

# Dataset Used

## **Text-to-Image:**

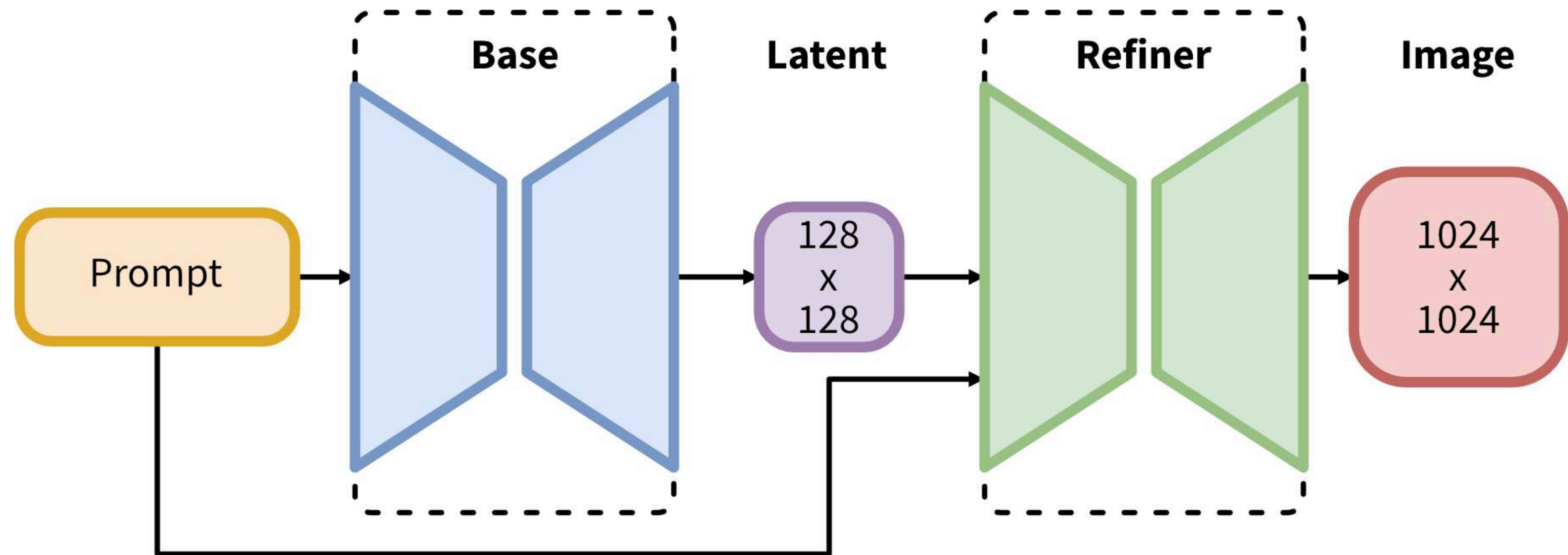
Stable Diffusion is trained on the LAION-5B dataset, which is a collection of image-text pairs derived from Common Crawl data

## **Image-to-Text:**

Model card for image captioning pretrained on COCO dataset - base architecture (with ViT large backbone)

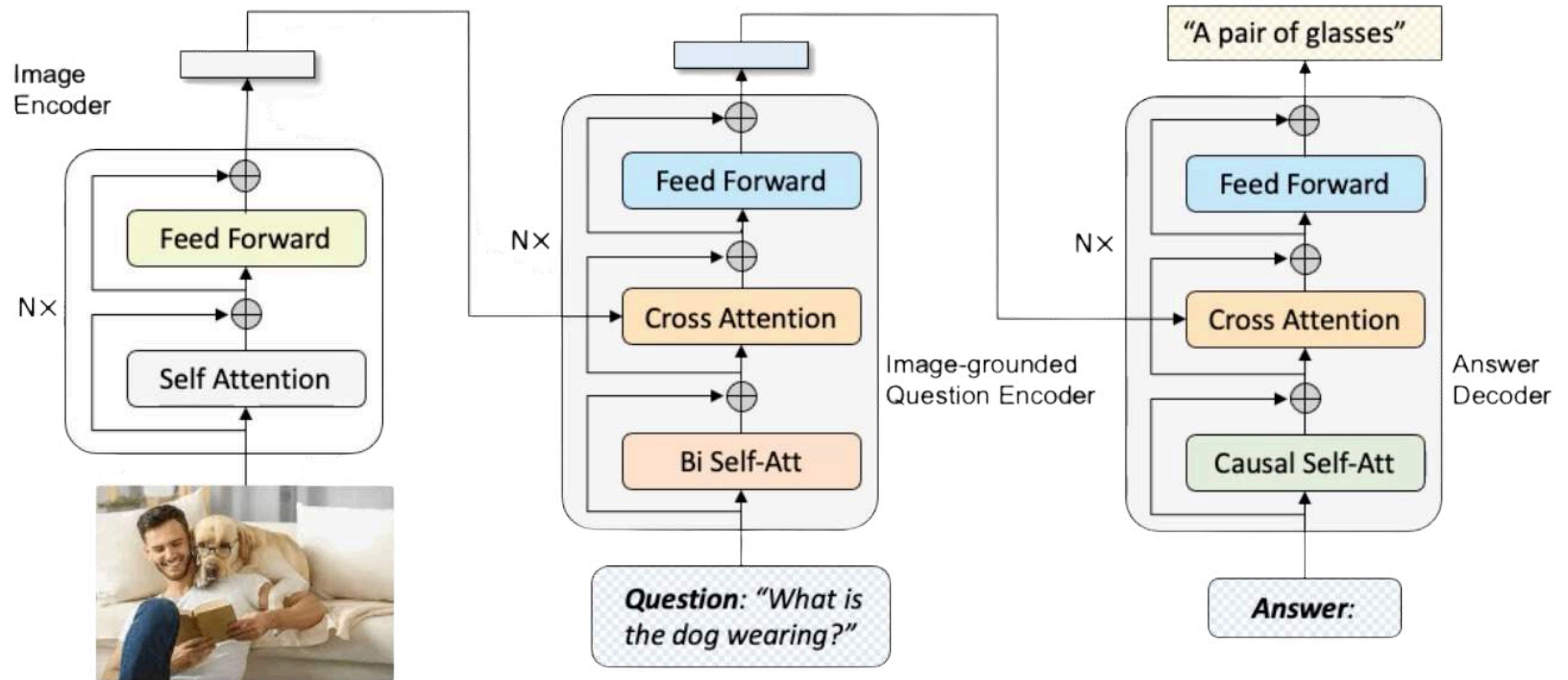
# Text-to-Image Model

**Text to Image:** stabilityai/stable-diffusion-xl-base-1.0



# Image-to-Text Model

Image to Text: salesforce/blip-image-captioning-large







# Thank You!

Questions or Comments?