Hands-on-Lab: Image Generation in Action

Estimated time needed: 45 minutes

Welcome to the hands-on lab image generation in action!

What is image generation in generative AI?

Images are vital to visual details because they comprehensively represent concepts, data, and information that users can easily grasp. For effective communication, images are powerful elements that add depth, context, and visual appeal to the information.

Generative AI models have advanced significantly in recent years, enabling the creation of new and realistic images using artificial intelligence techniques. Using generative AI-powered models and tools, you can generate and modify high-quality images that are difficult to distinguish from real photographs.

This lab focuses on the image-generation capabilities of generative AI. In this lab, you will look at the three image generation tools: Stable Diffusion, Hugging Face, and Simplified. You will explore these tools and use them to create images from textual descriptions, generate captions for images, and create thumbnails from the textual description.

Learning Objectives

After completing this lab, you will be able to:

- Explore the image generation capabilities of generative AI
- Create realistic images from text using Stable Diffusion XL
- Generate an image caption using Hugging Face's image-to-text
- Create small thumbnail images representing larger images using Simplified

Exercise 1: Create realistic images from text using Stable Diffusion Online

In this exercise, you will create realistic images using Stable Diffusion Online based on the textual prompts you provide to the generative AI tool. Stable Diffusion Online is powered by Stable Diffusion XL, a state-of-the-art tool offered by Stability AI. It takes English text as an input, called the "text prompt" and generates images based on the text description.

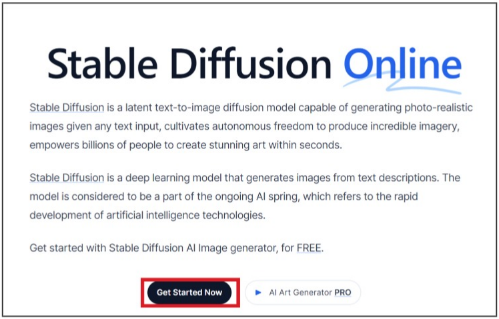
Step 1: Navigate to Stable Diffusion Online

1. Click Stable Diffusion Online to launch it.

> *If you cannot access Stable Diffusion Online by clicking on the link, copy the following URL and paste it into a browser.*

```
https://stablediffusionweb.com/
```

2. Once launched, you will view the webpage that provides an interface for generating images for free. Click on **Get Started Now** to navigate to the AI image generator section.



Stable Diffusion Online

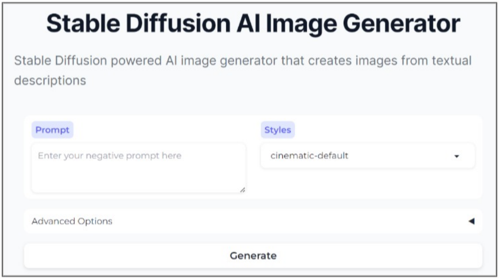
Stable Diffusion is a latent text-to-image diffusion model capable of generating photo-realistic images given any text input, cultivates autonomous freedom to produce incredible imagery, empowers billions of people to create stunning art within seconds.

Stable Diffusion is a deep learning model that generates images from text descriptions. The model is considered to be a part of the ongoing AI spring, which refers to the rapid development of artificial intelligence technologies.

Get started with Stable Diffusion AI Image generator, for FREE.

Get Started Now
▶ AI Art Generator PRO

3. You will be navigated to the Stable Diffusion AI Image Generator section.



Stable Diffusion AI Image Generator

Stable Diffusion powered AI image generator that creates images from textual descriptions

Prompt: Enter your negative prompt here

Styles: cinematic-default

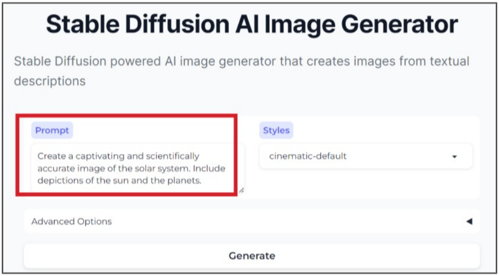
Advanced Options
Generate

Step 2: Generate the desired image

1. Consider a context for the realistic image.
2. Write the prompt or statement in the **Prompt** field.
   For example,

```
Create a captivating and scientifically accurate image of the solar system. Include depictions of the sun and the planets.
```

> *Note: Include specific details about the required image for better results.*



Stable Diffusion AI Image Generator

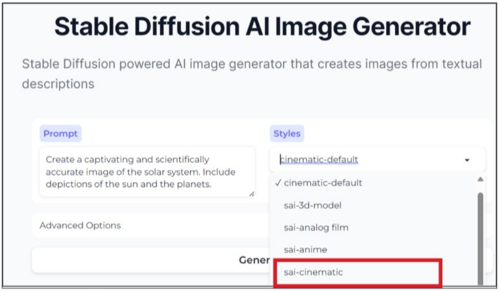
Stable Diffusion powered AI image generator that creates images from textual descriptions

Prompt: Create a captivating and scientifically accurate image of the solar system. Include depictions of the sun and the planets.

Styles: cinematic-default

Advanced Options
Generate

3. From the **Styles** drop-down list, you can select the desired style in which you want to generate the image. Let's select the **sai-cinematic** style.



Stable Diffusion AI Image Generator

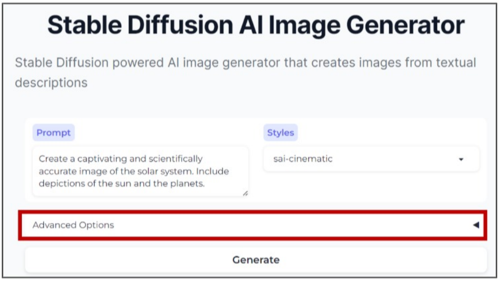
Stable Diffusion powered AI image generator that creates images from textual descriptions

Prompt: Create a captivating and scientifically accurate image of the solar system. Include depictions of the sun and the planets.

Styles: cinematic-default

✓ cinematic-default
sai-3d-model
sai-analog film
sai-anime
sai-cinematic
Advanced Options
Gener

4. Next, let's access the **Advanced** options to specify other attributes for the desired image. Click the left-pointing arrow for the Advanced options.



Stable Diffusion AI Image Generator

Stable Diffusion powered AI image generator that creates images from textual descriptions

Prompt

Create a captivating and scientifically accurate image of the solar system. Include depictions of the sun and the planets.

Styles

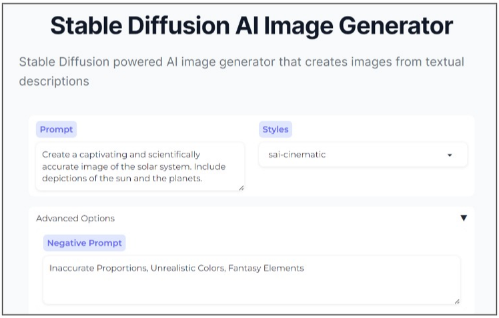
sai-cinematic

Advanced Options

Generate

5. Let's enter the negative prompt, which is used to specify any elements or attributes that you do not want in the generated image. Enter the following prompt in the **Negative Prompt** field.

```
Inaccurate Proportions, Unrealistic Colors, Fantasy Elements
```



Stable Diffusion AI Image Generator

Stable Diffusion powered AI image generator that creates images from textual descriptions

Prompt

Create a captivating and scientifically accurate image of the solar system. Include depictions of the sun and the planets.

Styles

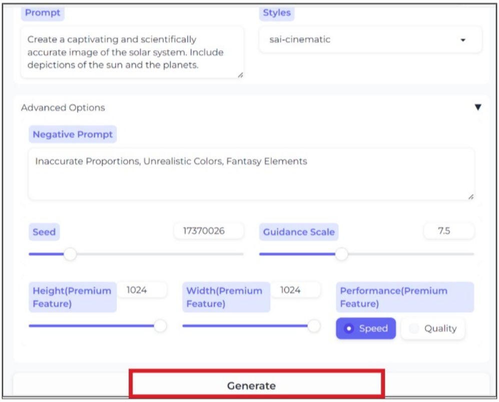
sai-cinematic

Advanced Options

Negative Prompt

Inaccurate Proportions, Unrealistic Colors, Fantasy Elements

6. Click **Generate** to send the message to the model.



Prompt

Create a captivating and scientifically accurate image of the solar system. Include depictions of the sun and the planets.

Styles

sai-cinematic

Advanced Options

Negative Prompt

Inaccurate Proportions, Unrealistic Colors, Fantasy Elements

Seed 17370026

Guidance Scale 7.5

Height(Premium Feature) 1024

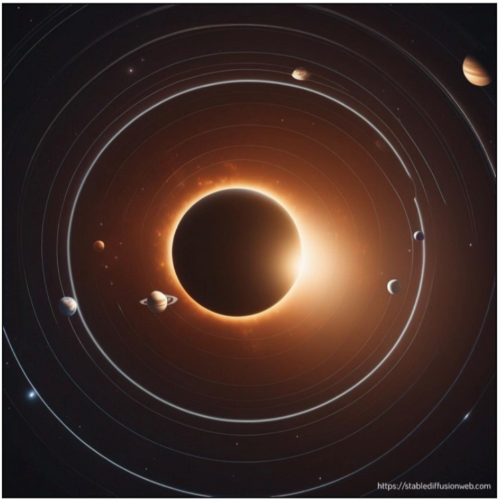
Width(Premium Feature) 1024

Performance(Premium Feature)

● Speed ○ Quality

Generate

7. After a few seconds, the image will be generated. The image that was generated at our end as the output is displayed here.


https://stablediffusionweb.com

> ***Note***: *You can continue interacting with Stable Diffusion to generate more and more images and iterations. You can click Generate image to regenerate the images for the description. You can also modify the description, and Stable Diffusion will show the revised set of images on the display field.*

> ***Note***: *The generated images may not be very good in quality or precision (in relation to the shared prompt) as this is a free image generator. To generate faster and better-quality images, you may consider upgrading to premium (pricing) plans.*

Step 3: Try yourself

Now, you can try to describe and generate realistic images of your choice using Stable Diffusion.

Exercise 2: Generate image caption using Hugging Face

In the digital age, image captions have gained even more importance due to their role in improving accessibility for people with visual impairments. Screen readers and other assistive technologies can read these captions aloud, allowing individuals who cannot see the image to understand its content. Generative AI models simplify the task of predicting the captions for the given image.

In this exercise, you will generate the caption for an image using GPT-powered Hugging face.

What is Hugging Face?

Hugging Face is well-known for creating and maintaining the "transformers" library, which provides a wide range of pre-trained NLP models, including the famous GPT (Generative Pre-trained Transformer) series models.

The Hugging Face "transformers" library allows researchers, developers, and data scientists to easily access and use state-of-the-art NLP models for various tasks, such as text generation, sentiment analysis, language translation, and more. The library provides interfaces and pre-trained models for both PyTorch and TensorFlow, making it convenient for users to work with their preferred deep-learning framework.

Let's generate captivating captions for the images using the Hugging Face's image-to-text model.

Step 1: Select the image for caption generation

Select the image for which you want to generate the caption.

Step 2: Launch Hugging Face

1. Click Hugging Face to launch it.
   > *Note: If you cannot access Hugging Face by clicking on the link, copy the following URL and paste it into a browser.*

```
https://huggingface.co/tasks/image-to-text
```

2. Once launched, you can directly use the platform for caption generation.

> *Note: Sign up or login is not mandatory to use the image-to-text model of Hugging Face.*

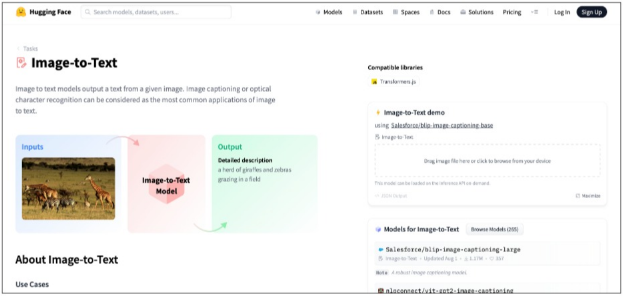

Hugging Face
Search models, datasets, users...
Models
Datasets
Spaces
Docs
Solutions
Pricing
Log In
Sign Up
Tasks

Image-to-Text

Image to text models output a text from a given image. Image captioning or optical character recognition can be considered as the most common applications of image to text.

Inputs
Image-to-Text Model
Output

Detailed description
a herd of giraffes and zebras grazing in a field

About Image-to-Text

Use Cases

Compatible libraries

Transformers.js

Image-to-Text demo

using Salesforce/blip-image-captioning-base

Image-to-Text

Drag image file here or click to browse from your device

This model can be loaded on the Inference API on-demand.

JSON Output
Maximize

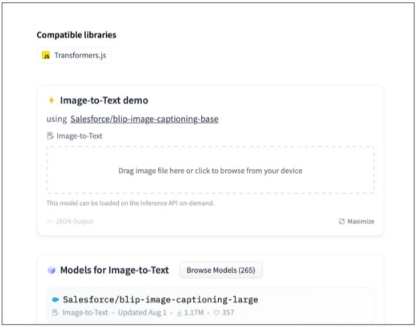
Models for Image-to-Text Browse Models (265)

`Salesforce/blip-image-captioning-large`
Image-to-Text · Updated Aug 1 · 1.17M · 357

`Note` *A robust image captioning model.*

`nlpconnect/vit-gpt2-image-captioning`

3. You can work on the model workspace on the right side of the home page, as shown below.



Compatible libraries

Transformers.js

Image-to-Text demo

using Salesforce/blip-image-captioning-base

Image-to-Text

Drag image file here or click to browse from your device

This model can be loaded on the Inference API on-demand.

JSON Output
Maximize

Models for Image-to-Text Browse Models (265)

`Salesforce/blip-image-captioning-large`
Image-to-Text · Updated Aug 1 · 1.17M · 357

Step 3: Generate the caption for the image

1. Insert the image for which you want to generate the caption in the prompt field. You can drag the image into the field or use the field option to select the image from your system or device.

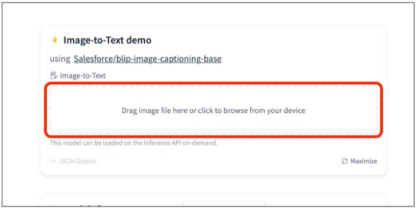


Image-to-Text demo

using Salesforce/blip-image-captioning-base

Image-to-Text

Drag image file here or click to browse from your device

This model can be loaded on the Inference API on-demand.

JSON Output
Maximize

2. The system then generates the caption within seconds, as shown in the screenshot below.

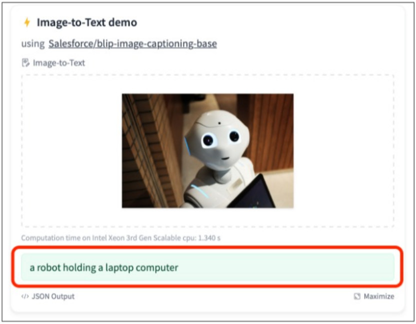


Image-to-Text demo
using Salesforce/blip-image-captioning-base
Image-to-Text
Computation time on Intel Xeon 3rd Gen Scalable cpu: 1.340 s
JSON Output
Maximize

a robot holding a laptop computer

3. Now, you must try generating captions for three images using Hugging Face's image-to-text generation.

Exercise 3: Create small thumbnail images representing larger images using Simplified [Optional]

Note: This exercise is optional as using the Simplified tool may require credits or paid subscription.

Thumbnails are small images that provide a preview of larger content, such as videos, images, or documents. This visual preview improves navigation, enhances the user experience, aids content organization, and contributes to marketing efforts across various digital platforms.

In this exercise, you will create a small thumbnail image representing a larger image using the Simplified tool.

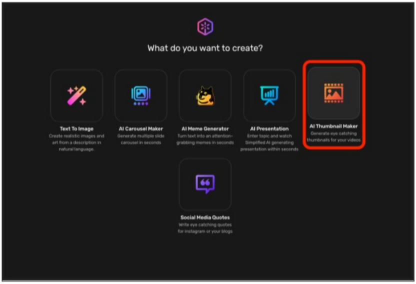
What is Simplified?

Simplified is a powerful web app that uses Generative AI models to create art, images, text, and more. It helps create text-to-image, carousels, memes, presentations, thumbnails, and quotes.

Let's generate a thumbnail representing the images or videos using Simplified AI Thumbnail Maker.

Step 1: Launch Simplified AI Thumbnail Maker

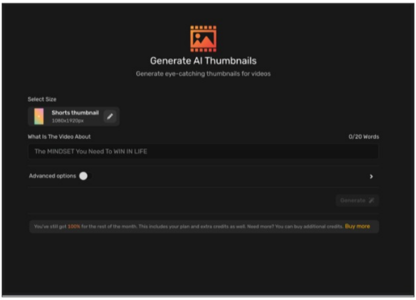
1. Click Simplified to launch it's generative AI apps. Select the **AI Thumbnail Maker** from the available options, as shown in the screenshot below.


What do you want to create?
Text To Image
Create realistic images and art from a description in natural language.
AI Carousel Maker
Generate multiple slide carousel in seconds
AI Meme Generator
Turn text into an attention-grabbing memes in seconds
AI Presentation
Enter topic and watch Simplified AI generating presentation within seconds
AI Thumbnail Maker
Generate eye catching thumbnails for your videos
Social Media Quotes
Write eye catching quotes for instagram or your blogs

Alternatively, you can directly launch the AI Thumbnail Maker by clicking Simplified AI Thumbnail Maker.

2. Once launched, you will view the **AI Thumbnail Maker workspace**, as shown in the screenshot below.

> *Note: You need to sign up or login to use Simplified's AI Thumbnail Maker. You get unlimited free credits for a month after signing up, followed by limited free credits to generate images using Simplified AI.*



Generate AI Thumbnails

Generate eye-catching thumbnails for videos

Select Size: Shorts thumbnail 1080x1920px

What Is The Video About: The MINDSET You Need To WIN IN LIFE

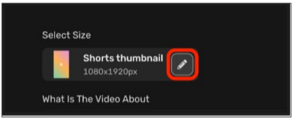
0/20 Words

You've still got 100% for the rest of the month. This includes your plan and extra credits as well. Need more? You can buy additional credits. Buy more

Advanced options
Generate

Step 2: Exercise the thumbnail generation

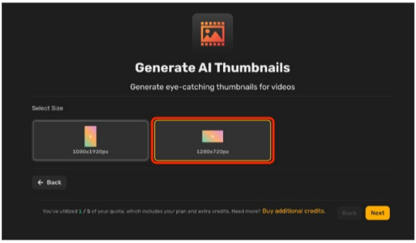
1. Click the pencil icon to select the thumbnail size.



Select Size: Shorts thumbnail 1080x1920px

What Is The Video About

2. You will see two options for the thumbnail size: Shorts thumbnail (1080x1920px) and Youtube thumbnails (1280x720px).



Generate AI Thumbnails

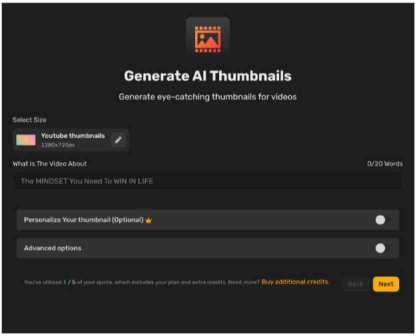
Generate eye-catching thumbnails for videos

Select Size

You've utilized 1 / 5 of your quota, which includes your plan and extra credits. Need more? Buy additional credits.

1080x1920px
1280x720px
Back
Back
Next

3. Select the **Youtube thumbnails** for this exercise. You will see the updated selection below **Select Size**, as shown in the screenshot below.



Generate AI Thumbnails

Generate eye-catching thumbnails for videos

Select Size: Youtube thumbnails 1280x720px

What Is The Video About: The MINDSET You Need To WIN IN LIFE

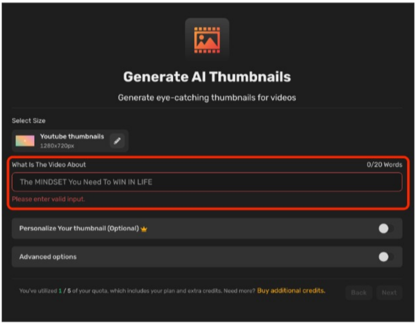
0/20 Words

You've utilized 1 / 5 of your quota, which includes your plan and extra credits. Need more? Buy additional credits.

Personalize Your thumbnail (Optional)
Advanced options
Back
Next

4. You must provide a description for the thumbnail in the field **What Is The Video About** in 20 words.
   For example,

```
Importance of IBM certification
```



Generate AI Thumbnails

Generate eye-catching thumbnails for videos

Select Size: Youtube thumbnails 1280x720px

What Is The Video About 0/20 Words

The MINDSET You Need To WIN IN LIFE

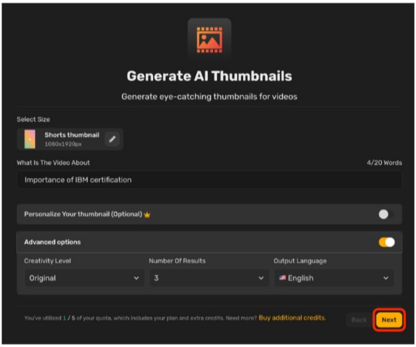
Please enter valid input.

You've utilized 1 / 5 of your quota, which includes your plan and extra credits. Need more? Buy additional credits.

Personalize Your thumbnail (Optional)
Advanced options
Back
Next

> *Note: You can also set the advanced options, like the number of results, creativity level, and output language.*

5. Now, click **next** and you will get various template options to choose from.



Generate AI Thumbnails

Generate eye-catching thumbnails for videos

Select Size: Shorts thumbnail 1080x1920px

What Is The Video About 4/20 Words

Importance of IBM certification

Advanced options

Creativity Level: Original

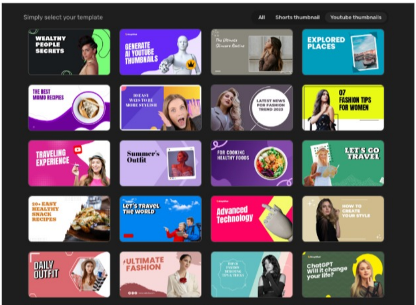
Number Of Results: 3

Output Language: English

You've utilized 1 / 5 of your quota, which includes your plan and extra credits. Need more? Buy additional credits.

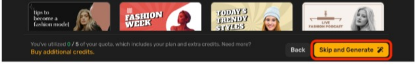
Personalize Your thumbnail (Optional)
Back
Next

6. Select the desired template from available template options and click **Generate** to get the thumbnail results.



Simply select your template

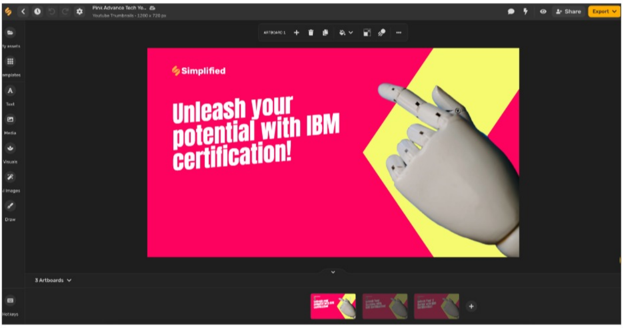
All
Shorts thumbnail
Youtube thumbnails
WEALTHY PEOPLE SECRETS
GENERATE AI YOUTUBE THUMBNAILS
The Ultimate Skincare Routine
EXPLORED PLACES
THE BEST MOMO RECIPES
10 EASY WAYS TO BE MORE STYLISH
LATEST NEWS FOR FASHION TREND 2023
07 FASHION TIPS FOR WOMEN
TRAVELING EXPERIENCE
Summer's Outfit
FOR COOKING HEALTHY FOODS
LET'S GO TRAVEL
20+ EASY HEALTHY SNACK RECIPES
LET'S TRAVEL THE WORLD
Advanced Technology
HOW TO CREATE YOUR STYLE
DAILY OUTFIT
ULTIMATE FASHION
ChatGPT Will it change your life?


tips to become a fashion model
FASHION WEEK
TODAY'S TRENDY STYLES
LIVE FASHION PODCAST
Back
Skip and Generate

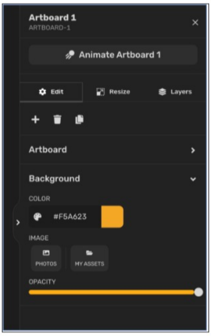
You've utilized 0 / 5 of your quota, which includes your plan and extra credits. Need more?
Buy additional credits.

> *Note: You can skip the template selection, which will generate a random result.*

7. The page will refresh to a new window and show the result options, as shown in the screenshot below.

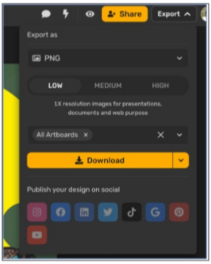

Pink Advance Tech Yo...
Youtube Thumbnails · 1280 x 720 px
Share
Export
ARTBOARD 1
y assets
emplates
Text
Media
Visuals
I Images
Draw
Hotkeys
Simplified
Unleash your potential with IBM certification!
3 Artboards

8. You can select the desired thumbnail from the options and edit it further in the **Artboard**, as shown in the screenshot below. You can edit, resize, or add layers as required.


Artboard 1
ARTBOARD-1
Animate Artboard 1
Edit
Resize
Layers
Artboard
Background
IMAGE
PHOTOS
MY ASSETS
OPACITY

COLOR #F5A623

9. You can download the desired thumbnail using the **Export** option available in the top-right corner of the screen, as shown in the screenshot below.


Share
Export
LOW
MEDIUM
HIGH
Download
Publish your design on social

Export as PNG

1X resolution images for presentations, documents and web purpose

All Artboards

10. Now, you must try generating three thumbnails using Simplified AI Thumbnail Maker.

Summary:

Congratulations! You just completed the hands-on lab Image Generation in Action.

In this lab, you explored image generation capabilities of Generative AI. You learned how to create realistic images from text using Stable Diffusion XL. You learned to generate captions for images using GPT-2-powered Hugging Face's image-to-text. You also learned how to create small thumbnail images using Simplified AI Thumbnail Maker.

© IBM Corporation 2023. All rights reserved.

Skills Network

IBM