# HOW TO COMBINE THE POWER OF OPENAI'S DALLE-3 IMAGE GENERATION AND STABLE DIFFUSION EDITING

Prerequisites

- Computer & ability to download files
- Python, or ability to download and install python
- Open command prompt (or terminal if Mac/Unix)
- Use a Text editor or even better, a code editor like Visual Studio Code (free)
- Ability to use an image editor. For example, GIMP.

Level required:

Advanced computer user or beginner programmer

ABSTRACT CODEX
https://abstractcodex.com


DALLE-3
Stable Diffusion
API
Generate
Edit
Inpaint
Outpaint

# Why use API methods instead of the web applications?

| Benefit | Explanation |
| --- | --- |
| Fairly inexpensive | Pay just for what you use |
| License | From my reading of the OpenAI and Stability AI websites, I believe images generated through the API can be used commercially. However, I'm not a lawyer, so don't take my word for this. Please read for yourself, or better yet ask a lawyer friend. |
| High resolution | High resolutions can be generated and edited. |
| Easy | Don't worry, I share my code for you to use. |

# Why not just use DALLE-3 inpainting?

## DALLE-3 inpainting isn’t supported through the API, only DALLE-2

From: https://labs.openai.com/

> We are no longer allowing new users to DALL·E 2. DALL·E 3 has higher quality images, improved prompt adherence, and we've started rolling out image editing. It is available for ChatGPT Plus, Team and Enterprise and the OpenAI API.

From: https://platform.openai.com/docs/guides/images

> Edits (DALL·E 2 only)
> Also known as "inpainting", the image edits endpoint allows you to edit or extend an image by uploading an image and mask indicating which ar

To confirm, I tried DALLE-3 inpainting via the API and it fails.

# Why not just wait for DALL-E 3 editing? Open AI says it is coming soon…

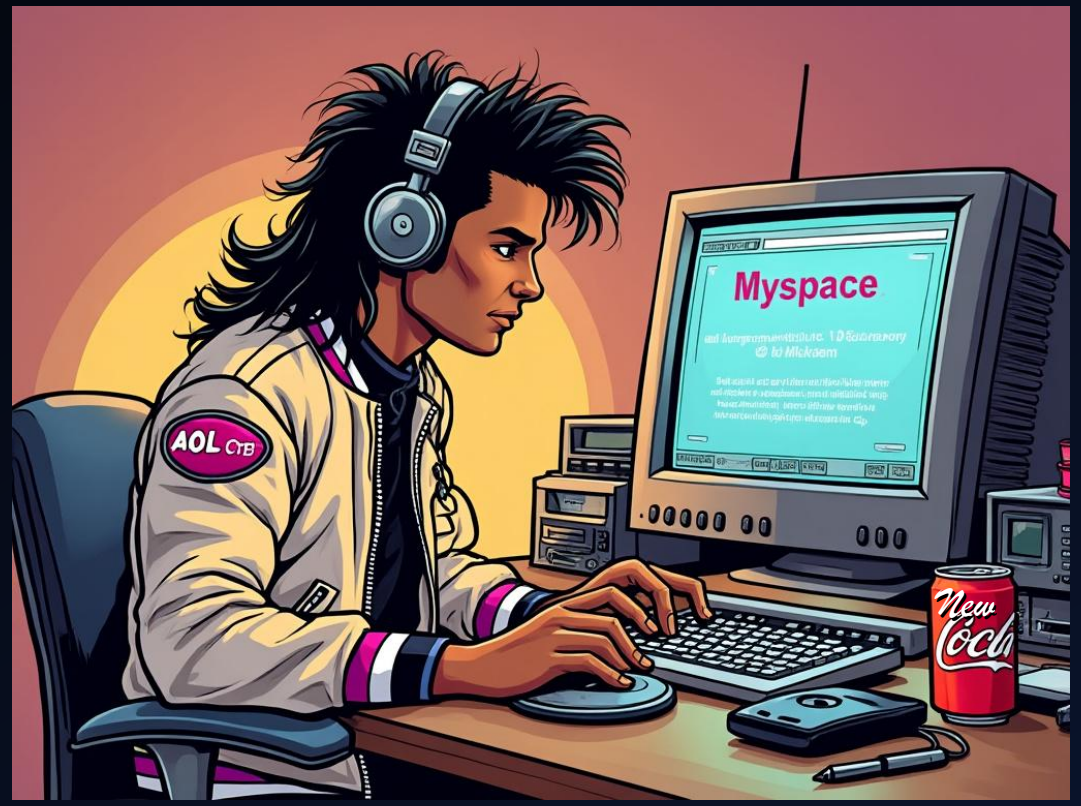
You could wait if you like, but they've had a "coming soon" message for a long time, and it is still not available as of this video's posting Dec 8th, 2024.

# Why not just wait for DALL-E 3 editing? Open AI says it is coming soon…

You could wait if you like, but they've had a "coming soon" message for a long time, and it is still not available as of this video's posting Dec 8th, 2024.

You could also wait for George R. R. Martin's Winds of Winter before reading another fantasy novel…

I’m aware that this claim might age poorly, but if Open AI does release DALLE-3 editing, hopefully this video is still found useful for generating and editing images through the APIs…



# Step 1: Configure Open AI API Access

1.1. Create an Open AI account (free) from https://openai.com and sign in.

1.2. Goto https://platform.openai.com/ . This page has a lot of useful tutorials.

1.3. Buy credits here: https://platform.openai.com/settings/organization/billing/overview

Buying credits can be a useful way to use the service as it limits how much you can be charged if you get carried away.

1.4. Generate an API key. Keep it secret, keep it safe!

https://platform.openai.com/settings/organization/api-keys

1.5. Save API Key as environment variable (export in Mac/Unix) OPENAI_API_KEY

Example: `OPENAI_API_KEY=sk-847598tj4h98jw984jy04j`

1.6 Open command prompt and run the following to install the library:

```
pip install openai
```

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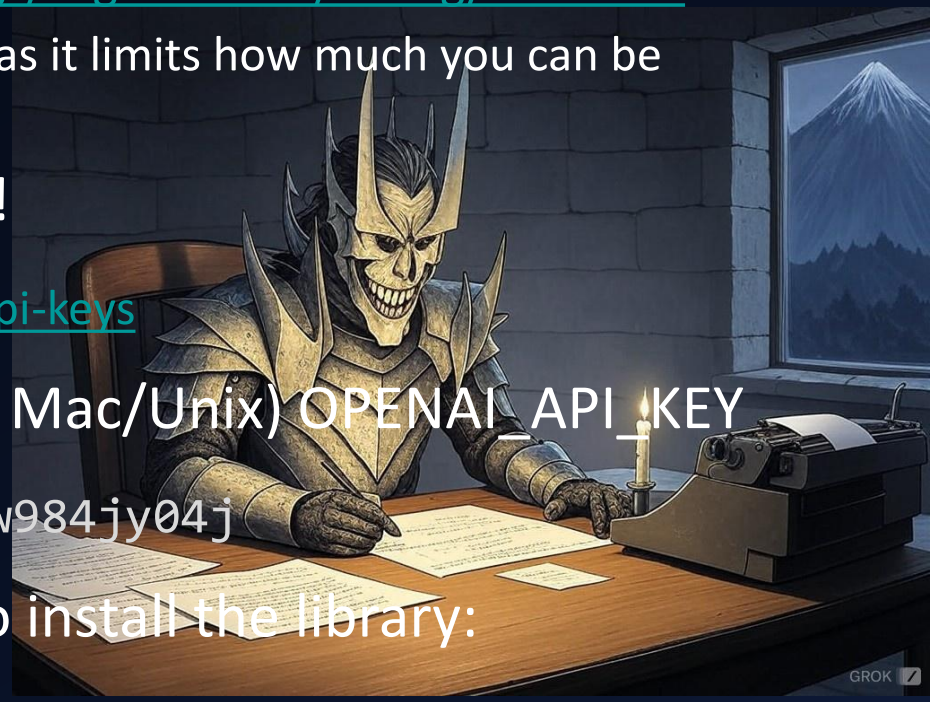


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# Step 2: Configure Stability API Access (Very Similar)

2.1. Create an Stability AI account (free) from https://stability.ai/ and sign in.

2.2. Buy credits here https://platform.stability.ai/account/credits

Buying credits can be a useful way to use the service as it limits how much you can be charged if you get carried away.

2.3. Generate an API key. Keep it secret, keep it safe!

https://platform.stability.ai/account/keys

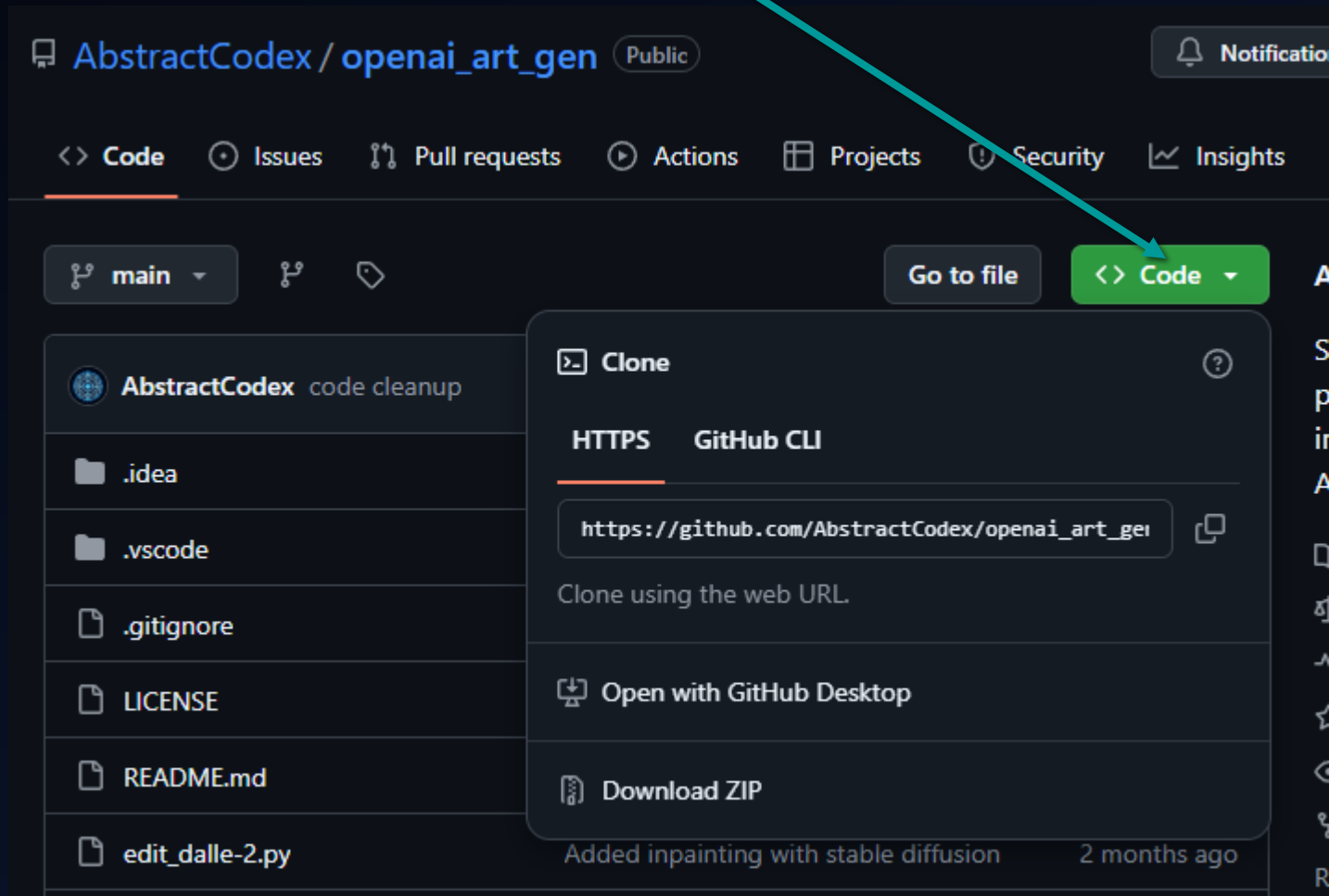
2.4. Save API Key as environment variable (export in Mac/Unix) STABLE_DIFF_KEY

Example: `STABLE_DIFF_KEY=sk-847598tj4h98jw984jy04j`

# Step 3: Download Abstract Codex openai_art_gen project from GitHub

3.1. Clone or download my project here:
https://github.com/AbstractCodex/openai_art_gen

3.2. Scan project for viruses. (I wouldn't do that to you, but you should always scan downloaded files in case servers get hacked).



# Step 4: Customize code

4.1. Open the ai_art_gen in Visual Studio Code, or another editor and open: gen.py

4.2. Edit the following variables:

Choose how many images you want to generate at once. Example of 2:

```
N = 2
```

Type what you want to generate. Example:

```
PROMPT = "An image of lone heroic medieval warrior”
```

4.3. Optional changes:

Choose resolution of image. Example:

```
size="1792x1024",  # DALLE-3 sizes: 1024x1024, 1792x1024, or 1024x1792
```

Choose quality. I recommend hd. “standard” is worse but cheaper.

```
quality="hd"
```

# Step 5: Generate images!

5.1. Run the gen.py program in your code editor, or type the following at the command-line:

```
py gen.py
```

5.2. The program will create web links.

5.3. Click the links or copy them into your web browser

5.4. Right click on the images to save them as files.


This looks cool, but my character Lantir wears a brigandine, not full plate!
Let’s fix it with Stable Diffusion inpainting!

# Step 6: Prepare image for modification

- For Stable Diffusion inpainting to work, you must erase the part of the image you want deleted.
- This means your image must have transparency.
- If using GIMP, select the layer, and add an alpha channel.
- Be sure to save the file as a .PNG file to keep the transparency.

# Step 7: Customize code to edit images with inpainting

7.1. Open the ai_art_gen in Visual Studio Code, or another editor and open: inpaint.py

7.2. Edit the following variables:

Type what you want to generate. Example:

```
PROMPT = "A medieval hero wearing a brass and fabric brigandine.”
```

Specify the Full path to file you want to make changes to. Example:

```
ORIGINAL_IMG = "D:/docs/tereya/images/cover-img.png”
```

Full path of where the modified file should be written. Example:

```
OUTPUT_IMG = "D:/docs/tereya/images/cover-img-modified.png"
```

Admire the results!

That’s pretty cool, but not a brigandine.

Admire the results!

Still not a brigandine.

Admire the results!

Maybe laminar?

Admire the results!

Breastplate

Admire the results!

Breastplate that would hurt your stomach when you sit down.

Admire the results!

Leather over chainmail?

Now for the twist…

I ended up using a talented artist on Fiverr (Levi F.) to make this change.

Why?

AI art generation is great for concepts it has been trained on. It knows about armor types common in popular fantasy medieval art, but not brigandines. Same problem occurred with the poleaxes. Plenty of references images of swords, but not poleaxes.

# The Final Artwork

This is just part of the image from my book cover, showing Lantir wearing his brigandine, wielding a poleaxe, and fighting a monster, whose face has been redrawn by an artist.

I’ve used the edits successfully for other changes though.

# Outpainting

- You can also use my example code to outpaint an image using Stable Diffusion.
- This allows you to extend the background in any direction to make your artwork a higher resolution, larger scene.
- Simply edit and run outpaint.py in the ai_art_gen to try it out!

# Outpainting

Edit the following variables within Inpaint.py:

- Set this prompt to what you want the final image to look like
  - PROMPT = "An abstract image of painted thick puffy bright cloudy sky. Use a photorealistic painter style."
- Set full path to file you want to extend
  - ORIGINAL_IMG = "D:/docs/tereya/images/house.png"
- Set full path of where the modified file should be written
  - OUTPUT_IMG = "D:/docs/tereya/images/house_with_sky.png"
- Set how far left you want to extend (in pixels)
  - LEFT = 1000
- Set how far above you want to extend (in pixels)
  - UP = 1000

`py outpaint.py` to run and get your extended artwork!

# Thanks for watching Abstract Codex

Feel free to like, subscribe, and comment.

And sign up for my mailing list at:

https://abstractcodex.com/signup.html

Social Media:

- X: @abstract_codex
- Rumble: @AbstractCodex
- Truth Social: @AbstractCodex
- Youtube: @AbstractCodex

Also, please check out my medieval fantasy novel coming in 2025.

## Heroes of Teraya

https://heroesofteraya.com

Amazon link will be available once released.