Introduction to Image generation AI

What are Image Generation AI Tools?

Image Generation AI Tools are computer programs that use artificial intelligence to create images based on text descriptions or other inputs.

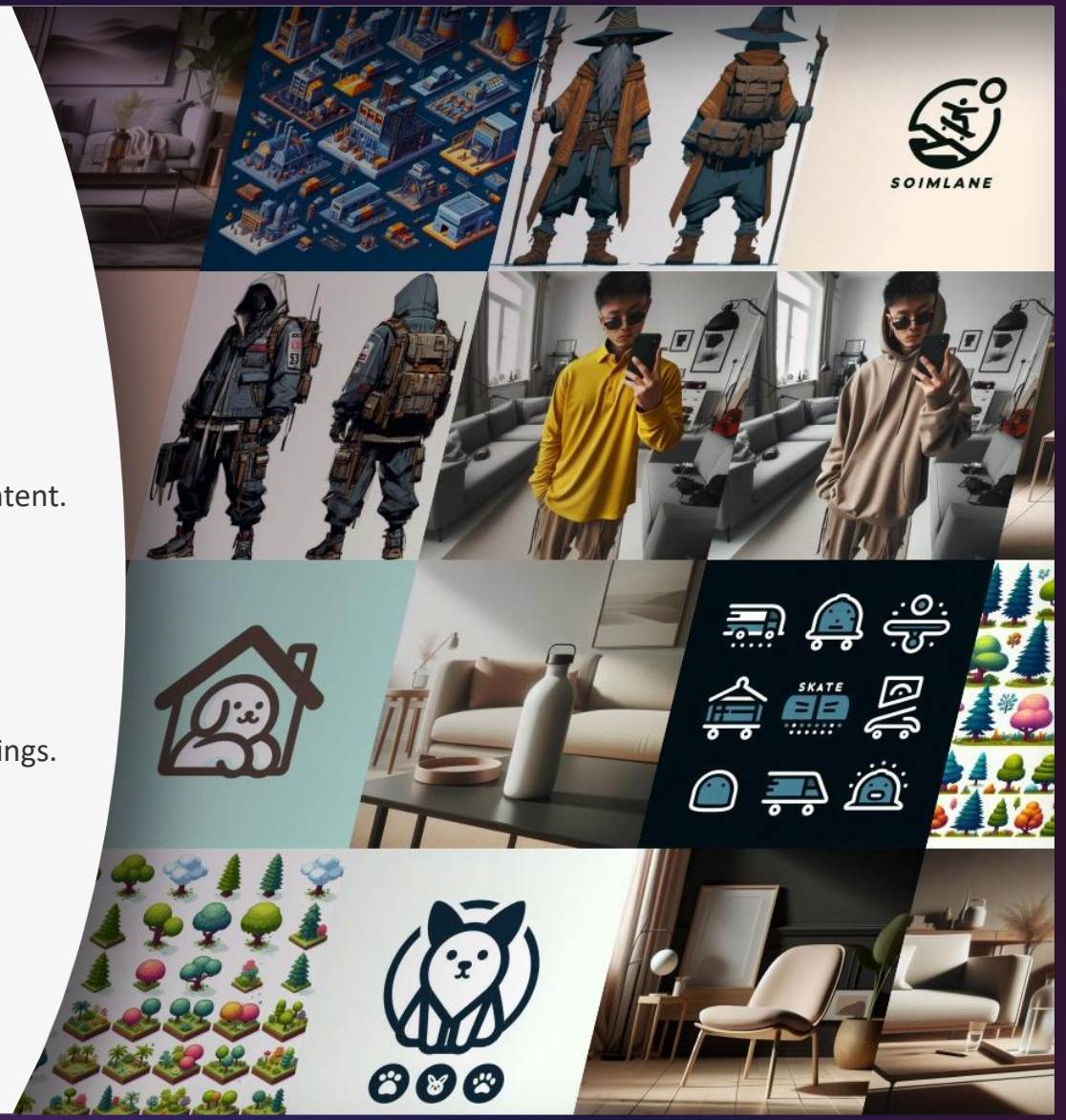
They learn from large collections of images and can understand common patterns and styles, so when you type in a description, they generate an image that matches your idea.

In simple terms, these tools make it easier for anyone to create visuals, whether you're a designer looking for a quick mockup or someone who just wants to experiment with creative ideas. They take the complexity out of drawing and help you see your ideas come to life on screen.

What are Real-World Applications of Image Generation AI Tools?

- Concept development: Generating concept art for characters, Interfaces, etc.
- Marketing: Generate visuals, creative ad concepts, and tailored social media content.
- Game Development: Create 2D assets ready to use in game engines.
- Fashion: Generate unique fashion styles and see how you look in them.
- Industrial Design: Create visualisations and mock-ups of products in various settings.
- Graphic design: Create logos, posters, illustrations and more

These icons were AI generated!



Which Image Generation AI will we be exploring today?

There are a countless number of image generation AI tools available. In this self-guided demonstration, we will explore a popular web-based service called **Leonardo.ai**.

Leonardo has a full suite of generative AI features, but today we'll just look at the basic features, to introduce you to image generation with AI.

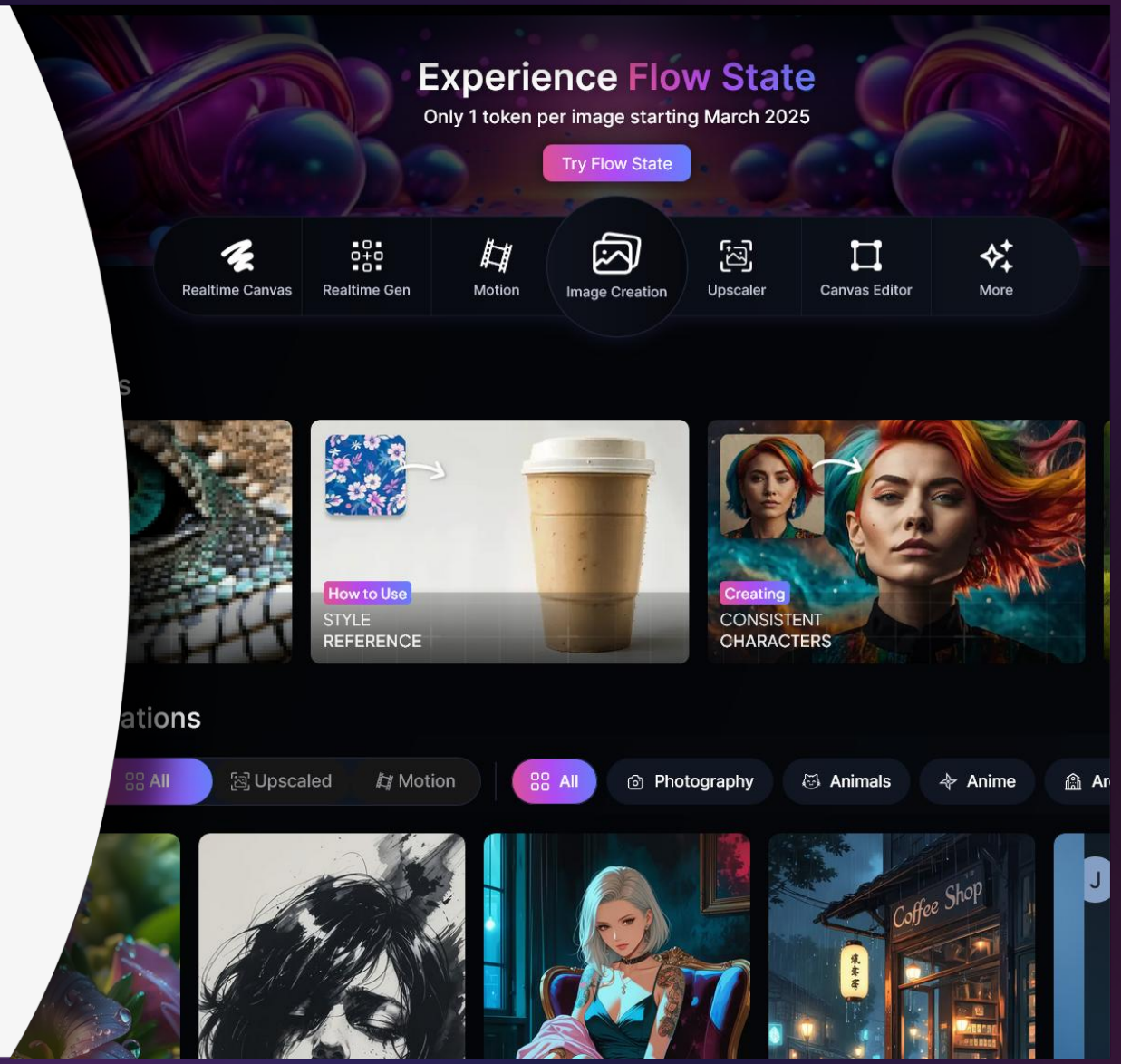
Leonardo.Ai

Activity Overview

To explore some of the capabilities of Leonardo we will do the following:

1. Generate an **image** using a simple prompt.
2. Generate a **video** using an existing image
3. Recognise the **limitations and challenges** of these tools.

These features are just the basics. Leonardo and other tools have many more powerful features, but these provide a good overview of what they can and can't do.



Getting Set Up

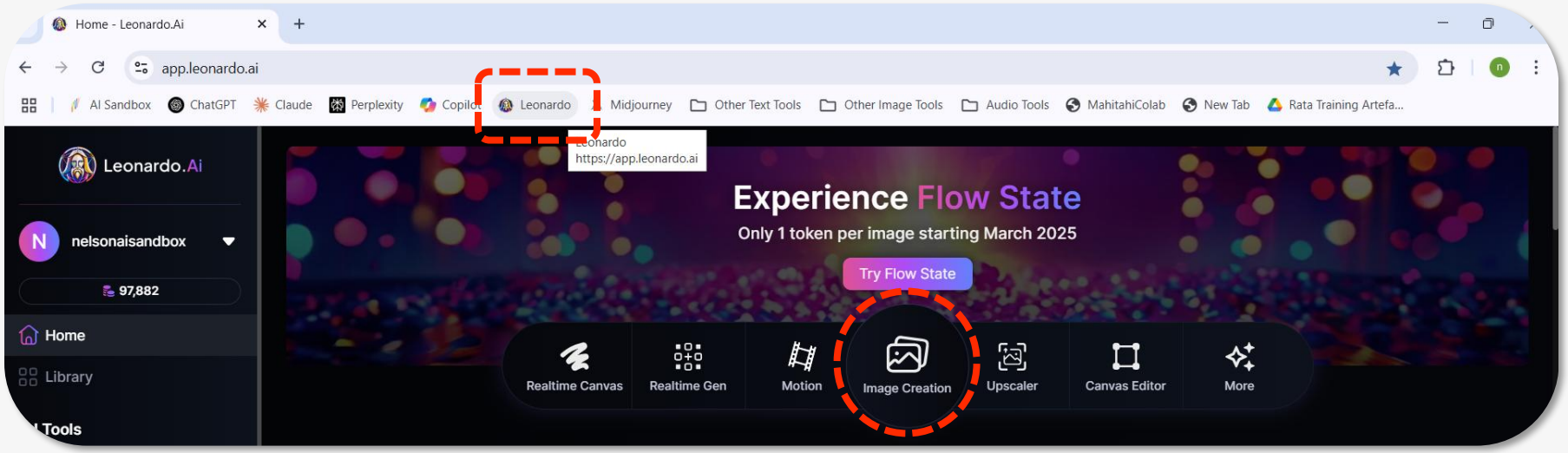
Here is the link to Leonardo.ai.

Leonardo.ai

To start generating images, click the “Image Generation” button in the centre of the page.

On the NAIS laptops, you can use the ‘favourites’ bar in the Chrome browser to open the tabs. You should be able to use each of them with the pre-populated NAIS login and password.

Chrome Favourites Bar:



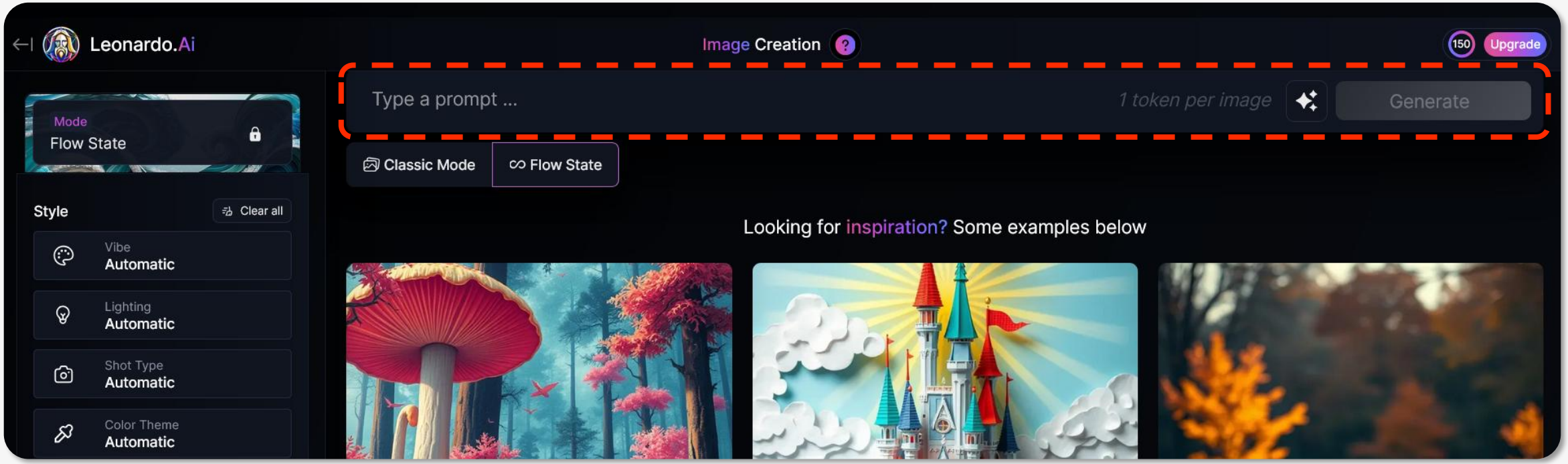
Generate an Image

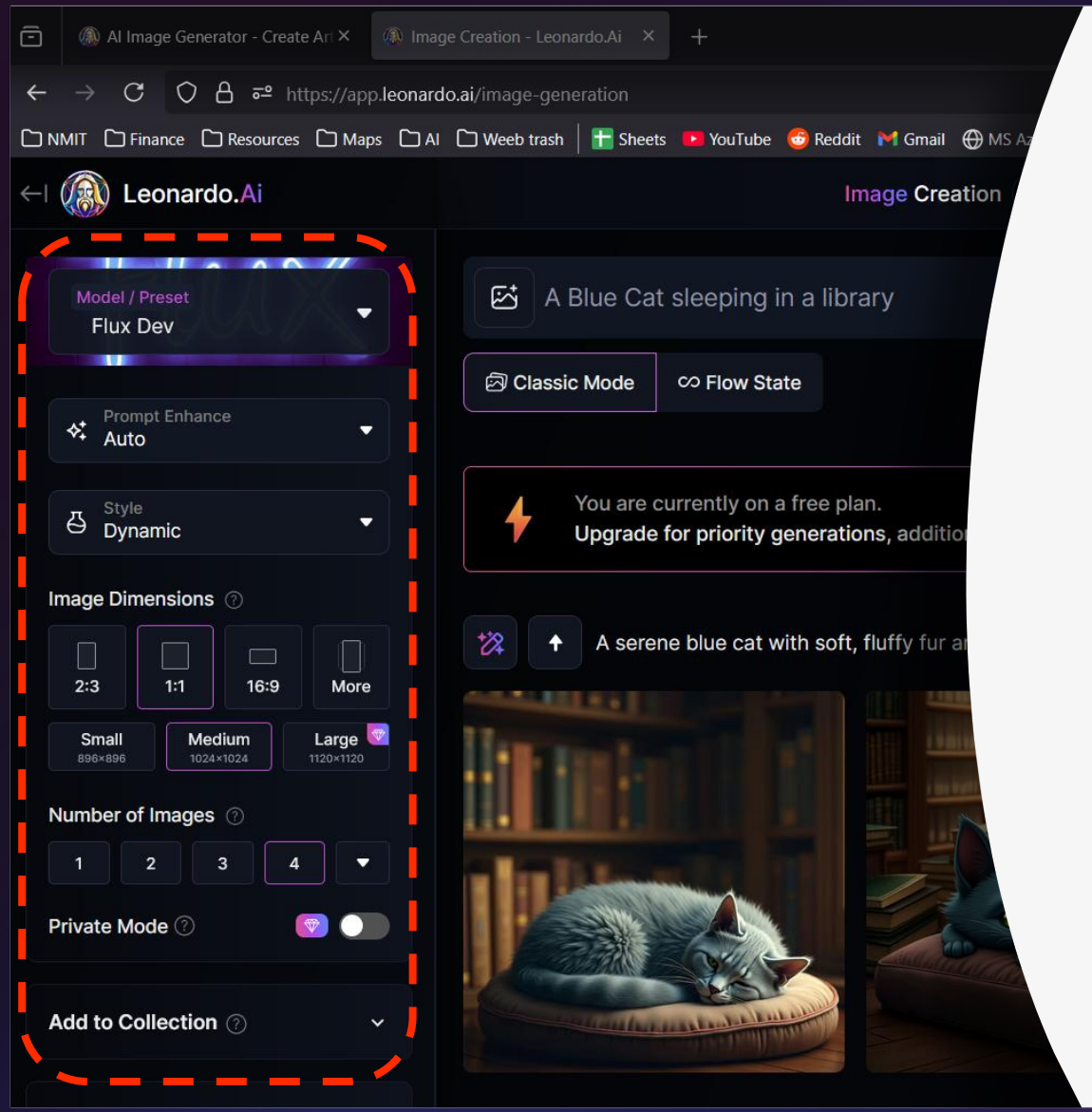
Writing a Simple Prompt

Leonardo, as well as most other image generation tools have a bar where you enter your prompt.

This prompt describes the image you want to generate. There are many ways to structure your prompt but let's start with a simple sentence. If you can't think of anything, try "A Blue cat sleeping in a library"

Leonardo.ai:





Generation Options

You may have noticed the **options sidebar** on the left of the images. This controls the many generation options you have such as:

- Model
- Prompt Enhance
- Style
- Image Dimensions
- Image Resolution
- Number of Images generated
- Private Mode

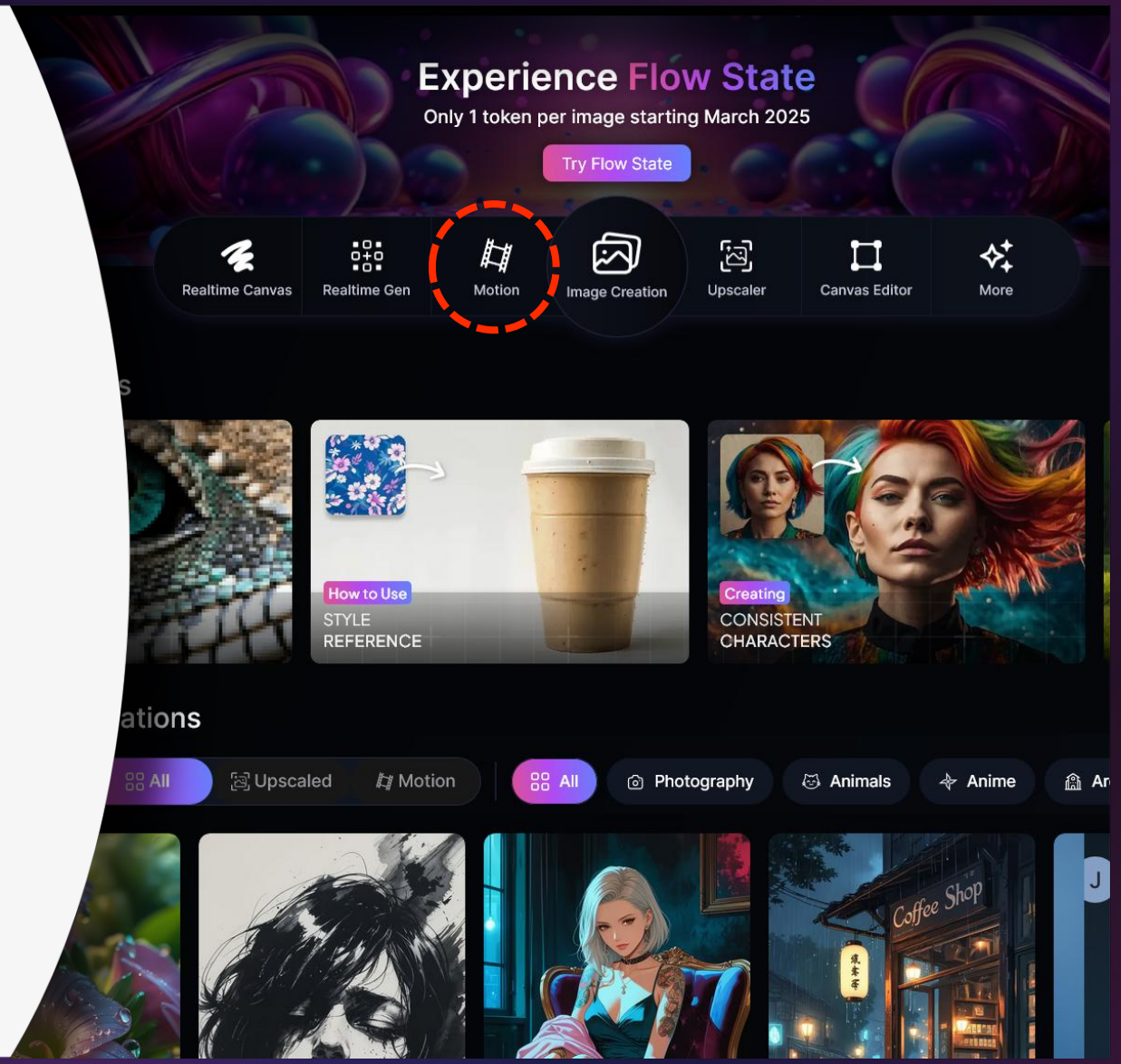
These options aren't very important for now, and most aren't available in the free version, but some such as '**Prompt Enhance**' which takes your prompt and adds additional detail to it, may have a big impact on the final image.

Generate a short video

Generating Motion

Another feature of Leonardo.ai is **generating short videos** from still images. You can access this feature from the main page by clicking on the “**Motion**” button.

Keep in mind this feature is not available for free accounts so you’ll need to use the AI Sandbox laptops or buy a subscription to access this.

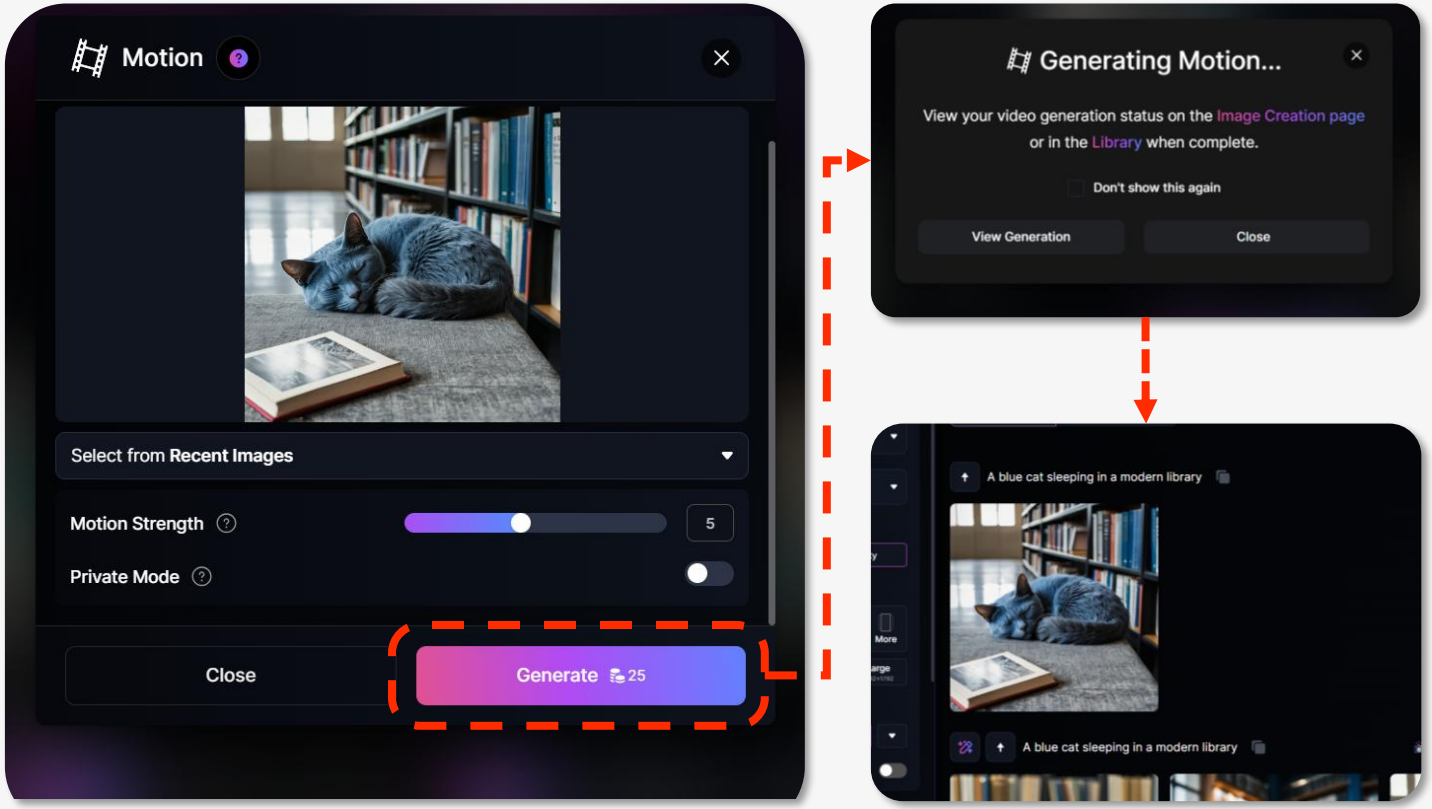


Generating Motion

To get started generating a short video, first **select the image you want to add motion to**. This can be an image you've generated with Leonardo or any image you upload from your computer.

Next, use the "**motion strength**" slider to choose how much motion, or movement, you want the video to have. Sliding it to the right will increase the motion, and sliding it to the left will decrease the motion.

Finally, Press the "**Generate**" button to start generating the video. Once it's done, it'll show up in your library with the images you're made with Leonardo.



Understanding Limitations

Understanding Limitations:

Generation Errors

Image generation tools aren’t perfect. It’s important to understand the limits of what they can create.

You may have already seen some AI images with obvious errors online. They often generate hands with too many or too few fingers. They can’t write understandable text. They struggle with perspective and straight lines. Patterns can ‘bleed’ into adjacent parts of the image. Etc.

Certain kinds of images can be difficult to generate due to these issues. Knowing what is difficult to generate and what is easy can greatly improve your productivity and cut down on unusable images. This is especially important if the image generator you’re using only has a limited number of generations.

Understanding Limitations:

Bias

In order to train these Image Generation Models, enormous amounts of images need to be fed into the training algorithm. The composition of this training data can present unintended bias in the generation.

For example, if you don't include enough information in your prompt, the AI will 'fill in the blanks' with whatever it feels like, which will often conform to stereotypes.

Another result of this bias is a lack of diversity in beauty standards. Image generators can struggle to create 'average' looking people and will often generate people who conform to specific beauty standards which it has been trained on. I.e. Instagram models.

Understanding Limitations:

Unsafe Imagery

With the ability to generate anything, comes the responsibility to not generate unsafe, inappropriate, or copyrighted imagery.

Every web-based image generator uses tools to detect and block any image generation it deems problematic. Often a single word can trigger these systems. These systems protect the Company and User, so this level of scrutiny is required, often by law.

Be aware that while these systems are hypervigilant, they aren’t perfect and can make mistakes.

Other Features

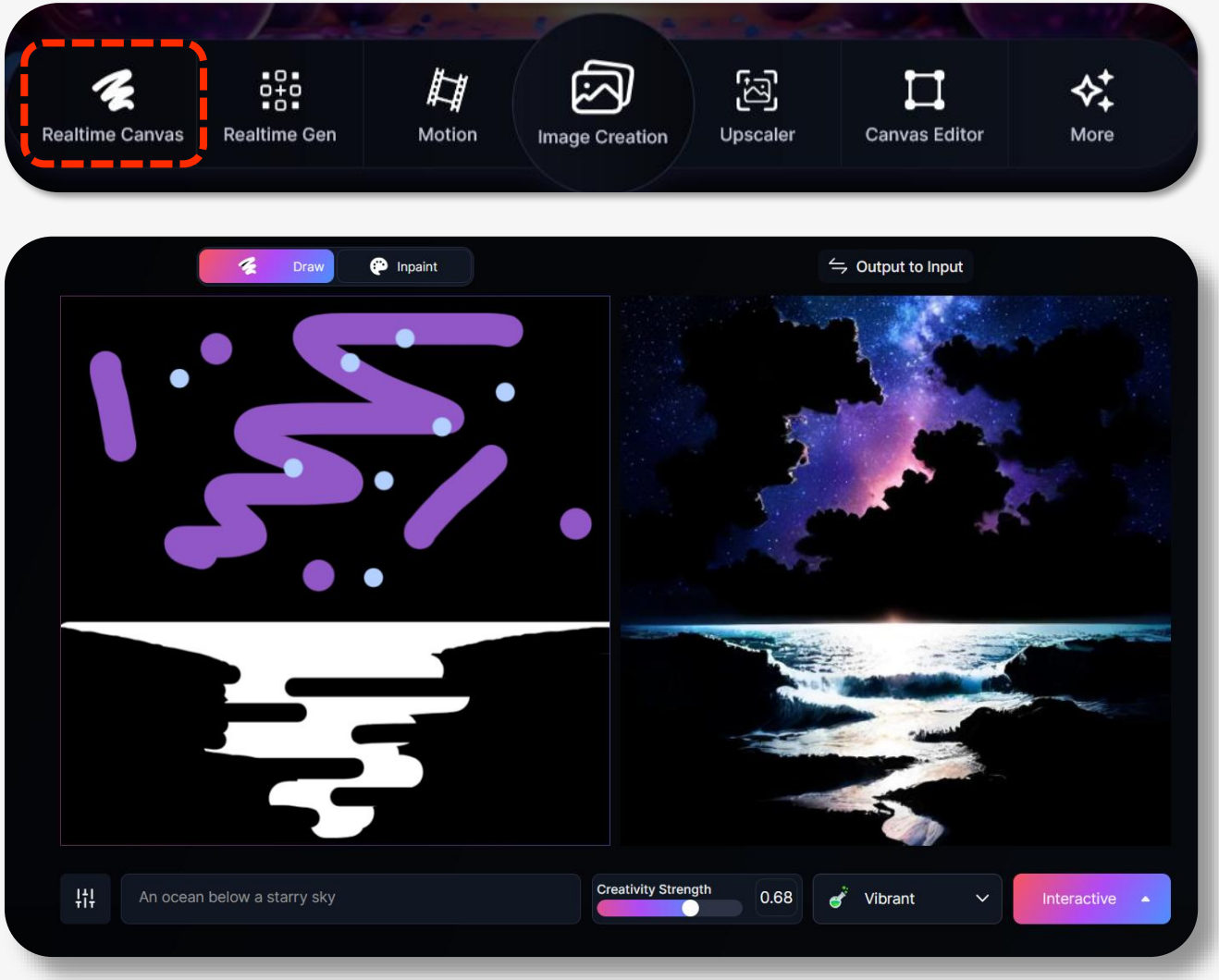
Other Features:

Realtime Canvas

Leonardo has an interesting feature called ‘Realtime Canvas’. It generates images in real-time based on the simple sketches you draw in the left box.

This can be useful for making your generated images conform to specific shapes or colours. It’s also free to use as much as you want without limits on how many images you can generate.

Give it a go and see what you can make with it!



Other Features:

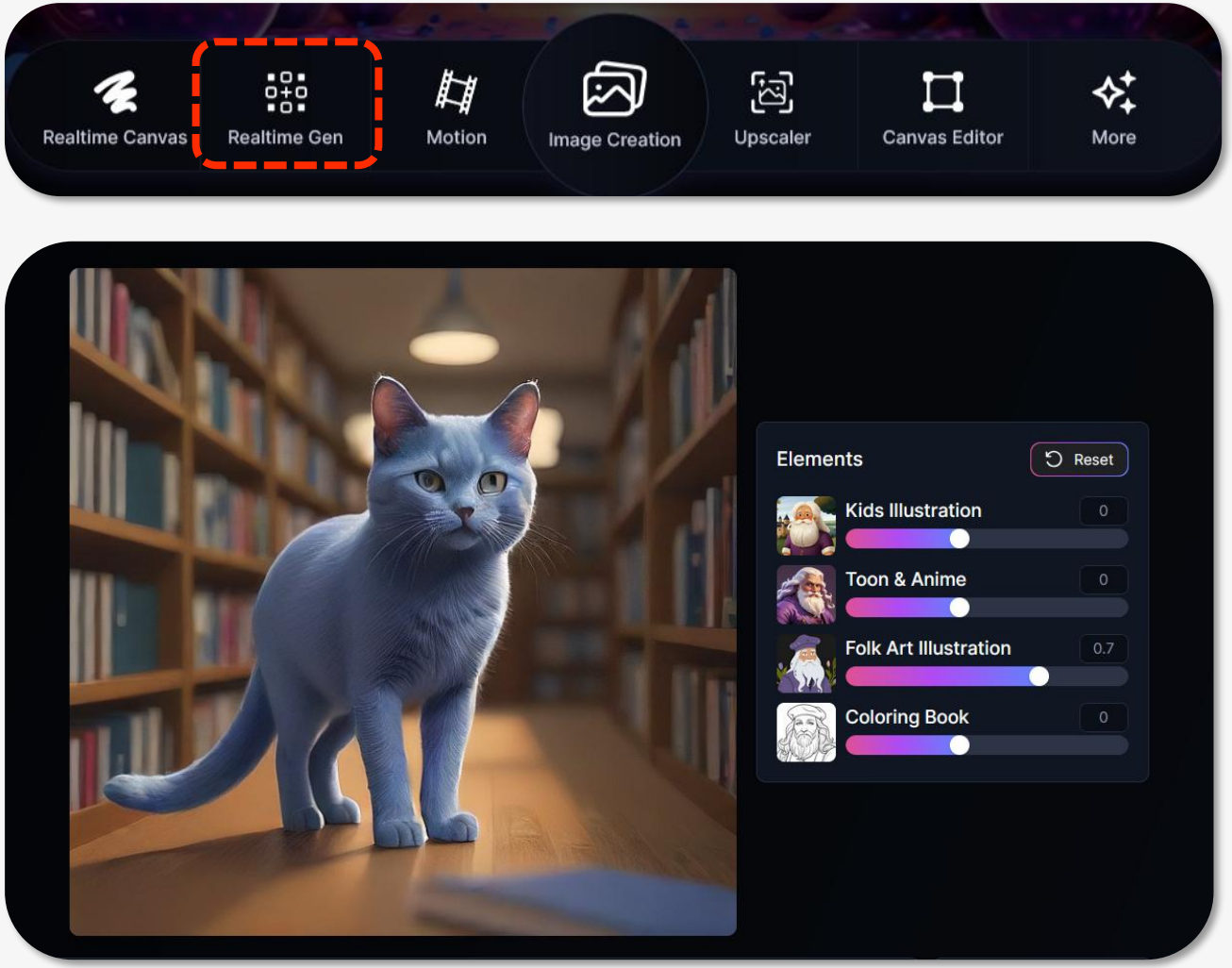
Realtime Generator

Another interesting feature of Leonardo is the real-time generator. It generates images in real time as you enter the prompt or change the ‘Elements’ values.

This tool is useful for understanding how AI image generators work. The ‘Elements’ values can alter the style of the image with weak, strong, or even negative values.

These elements are essentially additional prompts, and in fact, any prompt entered into an AI image generator can have the same strong, weak or negative values.

Try playing around with the Elements and see how the image changes!



Summary

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Through this demonstration, you've seen how Leonardo AI uses modern artificial intelligence to turn text prompts into engaging visual art. By applying smart algorithms and a well-trained model, it can create detailed and creative images that bring ideas to life. As the technology behind Leonardo AI continues to improve, users can expect even higher-quality visuals and exciting creative opportunities in the future.