## Activity 2.1.3 - Testing an AI image generator

| | |
|---|---|
| **Duration** | 90 minutes |
| **Requirements** | Having followed Activity 1 in Module 1 |
| **Hardware and Software tools used** | *Required*: a computer and an Internet connection. |
| **Glossary** | Deeplearning, DALL-E |

### Procedure (steps)

Craiyon (https://www.craiyon.com/), is an AI model that can draw images from any text prompt that you enter. For example, if you write “a painting of a class full of students, Picasso style” the algorithm generates these images:

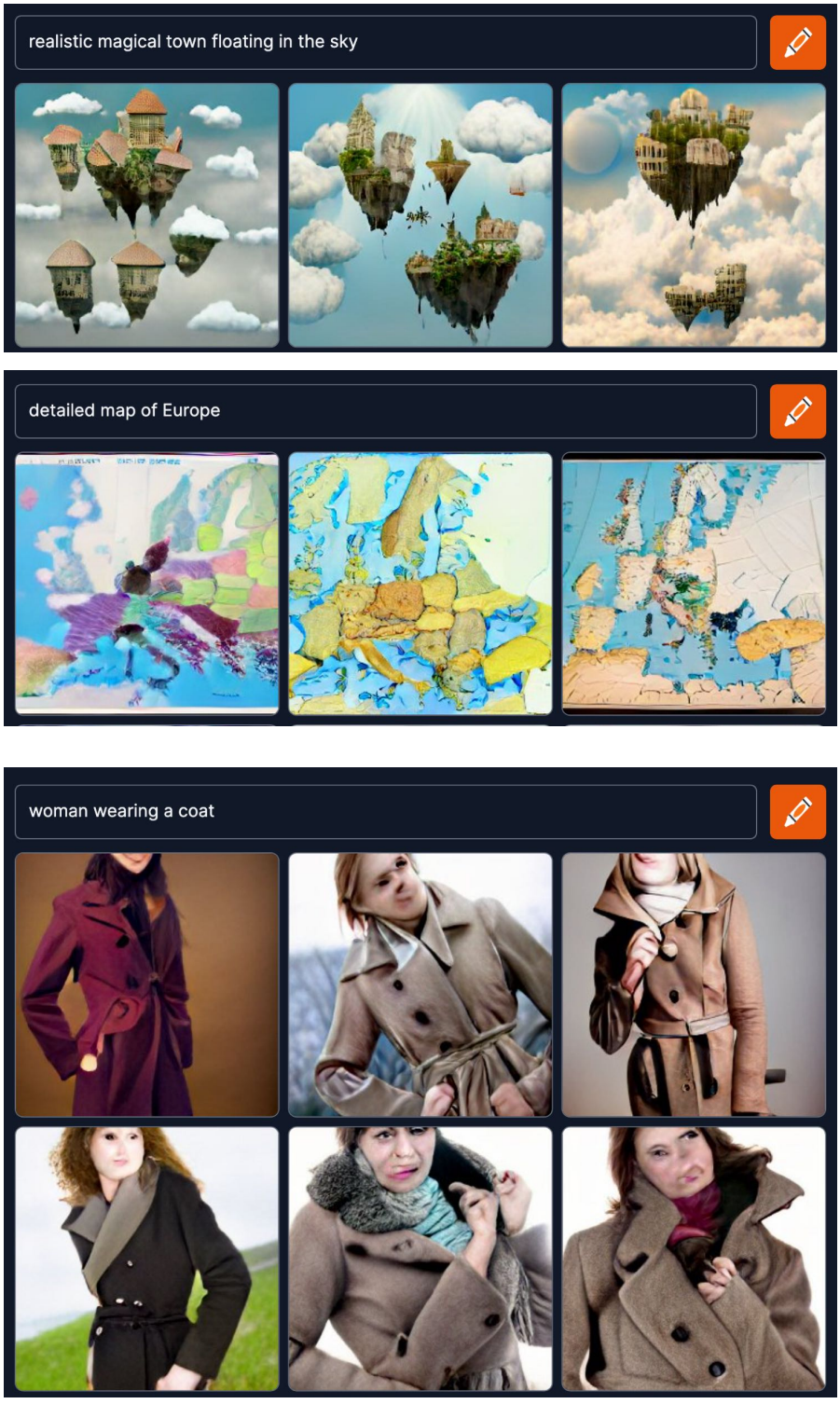
The Craiyon model is free to use for non-commercial purposes but sponsored by ads. The model is an alternative version of DALL·E mini, by the same developers and uses a version of GPT-3 modified to generate images. Basically, the model uses the semantic meaning extracted from the prompt to generate potential images. The image generation is the result of training a huge database of images and captions. Many news about DALL·E and similar machine learning models have been released in the past months discussing the potentialities and limitations of such tools (for example for manipulating images or creating deepfakes). There are also some ethical concerns with respect to the dataset used for the training and the biased representations generated by the model (for example, the reduced probability of representing women in the outputs, or of representing mostly white people). The capabilities of image generation models are impressive, but there are indeed some limitations: on the one hand, the model generates unexpected creations, but the same creations are also limited by stereotypes and bias which dominate the source of information used to train the model (this topic can be further discussed in Module 3).

**Direct Instruction & Guided Practice**

Introduce students to Craiyon interface and test some prompts, for instance:

- “realistic unicorn”
- "sand sculpture"
- "pencil drawing of a school"
- “realistic magical town floating in the sky”
- “detailed map of Europe” (this prompt can be used for making the class think about the quality of the created images)
- “Woman wearing a coat” / “Man wearing a coat” (inform students that the faces recreated by the algorithm might be scaring and not realistic - see below)

The teacher should empahise that the images created by the model are original and not copies of other images on the web - a comparison can be done by the results from a image search (such as Google Image) and the output of Craiyon.




**Independent Practice**

After this first activity that can be performed with the whole class, the teacher can create groups of 5-7 students. They can perform some tests with Craiyon and save the images they

created. A good indication would be to try to create a series of images having the same subject but using different graphical styles. For example:

- students can recreate the style of artists or an art style by modifying the prompt (for instance adding an artist's name generate an image that tends toward the named artist's style - e.g. "by Picasso", "by Klimt", "by Da Vinci", "futurist style", "realism", "impressionism". Also adding a title of a painting might change the image style)
- some keywords can change the graphical style of the generated images (for example adding "cartoon", "sketch", "steampunk", "horror")
- students can use the Craiyon to represent objects, places, animals, people - there might be some differences in the quality of the generated images

**Closing**

This is the perfect opportunity to open up the class for a group discussion. Teachers can ask students questions that help them realize the importance of the activity with questions like, "How does Craiyon work?", "Who is the Craiyon's teacher?", "How the results are influenced by the prompts we give?".

Students might also notice that celebrities or cartoon characters often come out as blobs that vaguely resemble the original, and realise that the model really cannot recreate faces very well. This is because as humans we are very good at recognizing faces and we spot any minimal misshape - while the model tries to recreate the face, it makes mistakes and we can easily spot them. The model uses the same technique for recreating other objects such as the moon, a landscape or a tree. In these cases, we do not really notice the issues and they appear accurately represented.

## Troubleshooting

| Possible issue | Possible solution |
|---|---|
| The prompt for the system can only be in English | The teacher can prepare some pre-made prompts to use in class. Otherwise, it might be an opportunity for involving the English teachers |
| The service might take some time for creating the images | Instead of focusing on creating many different images, make the students use only one prompt and then save the image and work on it |
| Face generated by the algorithm might be weird or scaring | The teacher should consider this aspect before using this tool in class. The teacher might also use pre-made prompts and show how the algorithm work to the class (without |

| | |
|---|---|
| | independent practice) |

## Resources for teachers

Below are some online resources that may be useful to facilitate the transmission of concepts by teachers during the proposed activity in the classroom:

- Article explaining Dall-E model (that is similar to the model used by Craiyon) https://cv-tricks.com/how-to/dall-e-text-to-image-generation/
- Article on the ethical concerns of AI image generators https://www.wired.com/story/the-joy-and-dread-of-ai-image-generators-without-limits/
- Website containing examples and tips for prompts https://dallery.gallery/

*Wordalle* is a game that combines Wordle and DALL-E and challenge the player to guess the prompt used for generating the images using the Wordle rules. The game can combine English activities with a discussion on how AI models work.
https://huggingface.co/spaces/huggingface-projects/wordalle