BRAGA LTTA EVENT - FAIAS

LEARNINGML ACTIVITY

Image & Text Recognition

01/06/2022

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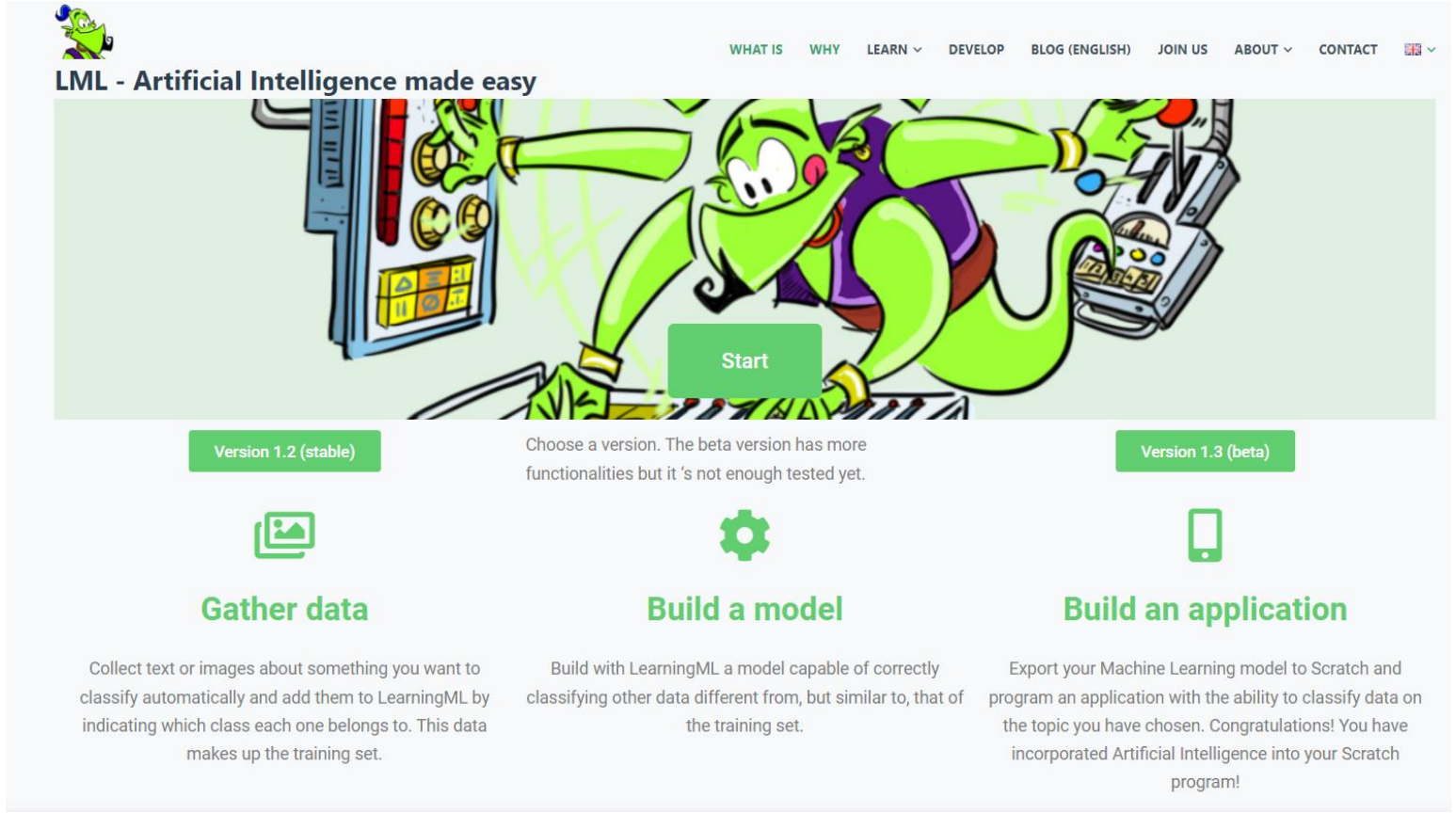
LEARNINGML WEB



https://web.learningml.org/

LEARNINGML WEB

LearningML consists of two javascript-based applications:

- The Machine Learning model editor (learningml-editor): It is the tool with which ML classification models are created by collecting labeled examples.
- The lml-scratch programming editor: lml-scratch is a modification of the well-known Scratch project. That is to say, I have taken the original Scratch code and added the necessary code to communicate with the ML model editor and to incorporate new blocks.

Stable version 1.2:

This is the default version of the webpage, it has two functionalities already tested and with optimal operation (*Image recognition* and *Text recognition*)

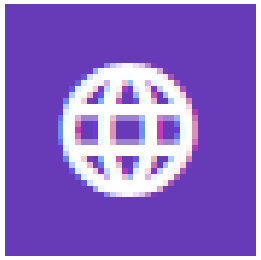
https://web.learningml.org/

LEARNINGML WEB

9

español
english
galego
català
euskera
italiano
deutsch
Ελληνικά
português

AVAILABLE LANGUAGES IN BETA VERSION



7

español
english
galego
català
italiano
deutsch
Ελληνικά

AVAILABLE LANGUAGES IN STABLE VERSION

https://web.learningml.org/

PART 1: IMAGE RECOGNITION

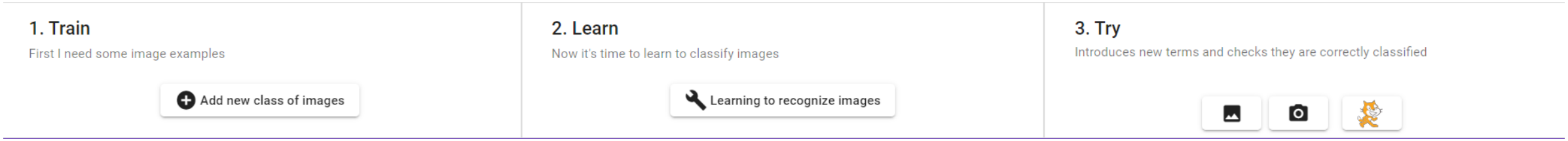
IMAGES: ABILITY OF THE SOFTWARE TO IDENTIFY OBJECTS AND GEOMETRIES TO ELABORATE A SERIES OF RELATIONS BETWEEN DIFFERENT IMAGES IN ORDER TO ASSOCIATE THEM TO ONE ESTABLISHED GROUP

CLASS OF IMAGES → UPLOAD/TAKE IMAGE → UPLOAD/TAKE A COMPARATIVE IMAGE → RESULTS

https://learningml.org/editor/

PART 1: IMAGE RECOGNITION

LEARNINGML IMAGE EDITOR INTERFACE

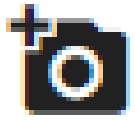


https://learningml.org/editor/model/image

PART 1: IMAGE RECOGNITION

ADD NEW CLASS OF IMAGES: create a new set add images the related examples

ADD IMAGES: import to the created class/comparative image a new image from your computer



ADD IMAGES FROM THE WEBCAM: use your hardware to take photos and import them into the created class or your comparative image

ADD NEW CLASS OF IMAGES: create a new set add images the related examples

REMOVE TAG: delete a created class

SCRATCH PROGRAMMING: write a program in Scratch which is able to recognise similar but different images to the ones that you used to teach the computer

https://learningml.org/editor/model/image

PART 1: IMAGE RECOGNITION

STEP 1. TRAINING

- Collect examples of texts you want to recognise.
- You can add new tags or classes (= names of the types of things you want to recognise with LML).
- A minimum of 10 examples of each class are recommended.

STEP 2. LEARNING

- In the default mode, it's a black box method to teach the computer to understand your examples added in the training part to recognise new images and associate them with your classes.
- In the advance mode you can edit some parameters of the process.

STEP 3. TRY

- Import your input to compare with the examples of the different classes created previously.

https://learningml.org/editor/model/image

PART 1: IMAGE RECOGNITION

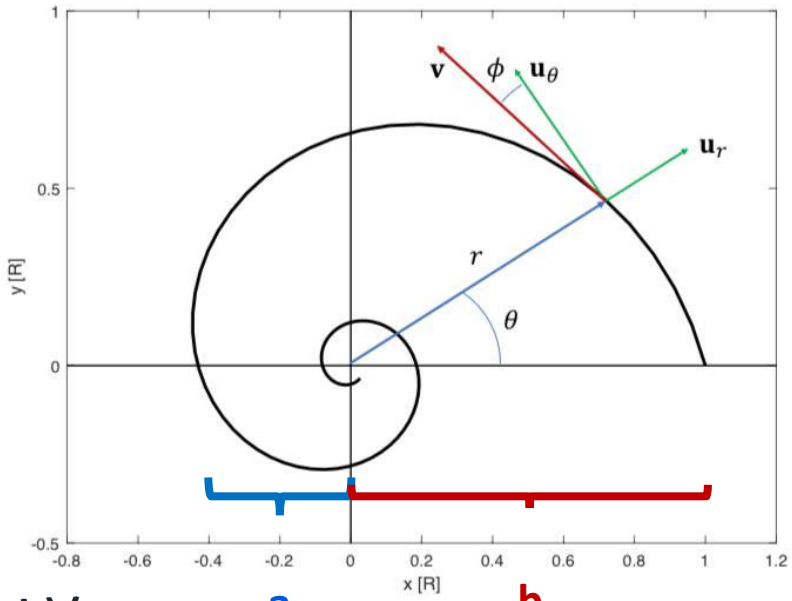
EXAMPLE PART 1: THE 5 PATTERNS/SERIES IN NATURE (MATH LESSON)

1. **Identify** the class names (what's the patterns names and number of it?) → 5 classes.
   - Spiral pattern, Fractal pattern, Symmetry pattern, Dunes/waves pattern & Chaos pattern.
2. **Create** the different classes.
3. **Upload** the corresponding images to each class (10 images recommended for each class).
4. **Train** the AI to detect coincidences between the images of each group.
5. **Try** the model uploading a new image input to compare.

https://learningml.org/editor/model/image

PART 1: IMAGE RECOGNITION

EXAMPLE PART 1: THE 5 PATTERNS/SERIES IN NATURE (MATH LESSON)



Φ= a/b=(a+b)/a **a** **b** **1.6180339887…**

https://learningml.org/editor/model/image

PART 2: TEXT RECOGNITION

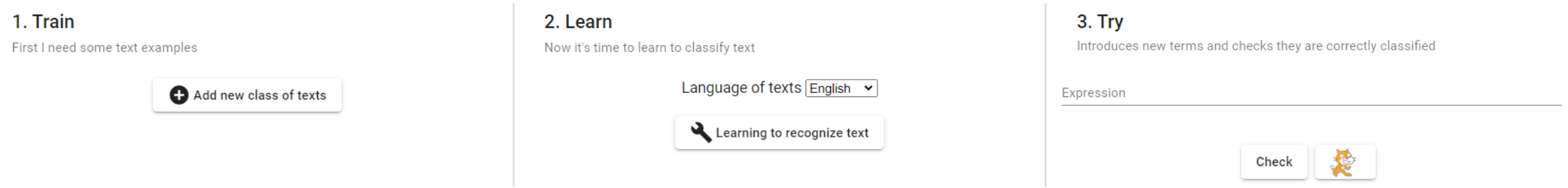
TEXTS: EXTRACTION, ASSOCIATION AND ANALYSIS OF THE INFORMATION AND STRUCTURE OF TEXT INPUT IN ORDER TO DETERMINATE ITS CLASS MEMERSHIP

CLASS OF TEXTS → TEXTS → COMPARATIVE EXPRESSIONS → RESULTS

https://learningml.org/editor/

PART 2: TEXT RECOGNITION

LEARNINGML TEXT EDITOR INTERFACE



https://learningml.org/editor/model/text

PART 2: TEXT RECOGNITION

TRAINING

- Collect examples of texts you want to recognise.
- You can add new tags or classes (= names of the types of things you want to recognise with LML).
- A minimum of 10 examples of each class are recommended.

LEARNING

- In the default mode, it's a black box method to teach the computer to understand your examples added in the training part to recognise new texts and associate them with your classes.
- You need to select the language of you
- In the advance mode you can edit some parameters of the process.

TRY

- Write your input to compare with the examples of the different classes created previously.

https://learningml.org/editor/model/text

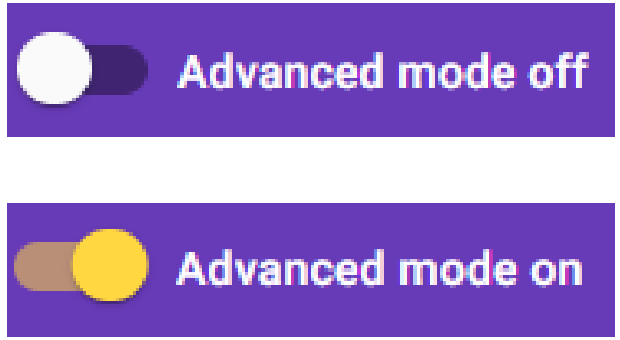
PART 2: TEXT RECOGNITION

EXAMPLE PART 2: 4 GEOGRAPHICAL ACCIDENTS (GEOLOGY LESSON)

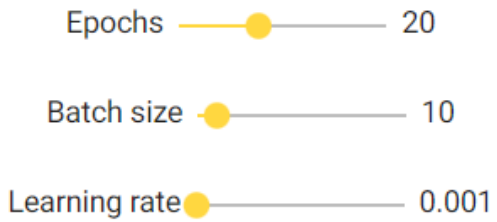
1. **Identify** the class names (what's the patterns names and number of it?) → 4 classes.
   - River, Mountain Range, Plains, Depression.
2. **Create** the different classes.
3. **Upload** the corresponding images to each class (10 text examples recommended for each class).
4. **Train** the AI to detect coincidences between the texts of each group.
5. **Try** the model writing a new text input to compare.

https://learningml.org/editor/model/text

ADVANCED MODE (AVAILABLE IN V1.3)



This mode offers us some control over the execution of the algorithm, as well as information about the result.



- Adjustable parameter of the Neuronal Network:
  - **Batch Size:** defines the number of samples to work through before updating the internal model parameters.
  - **Epochs:** defines the number times that the learning algorithm will work through the entire training dataset.
  - **Learning rate:** determines the step size at each iteration while moving toward a minimum of a loss function.

https://beta.learningml.org/editor/