



universidade
de aveiro



Imageable

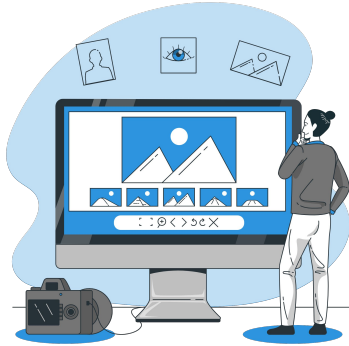
Reimagine your past.

21th May 2021

Project in Informatics Curricular Unit | Group 03

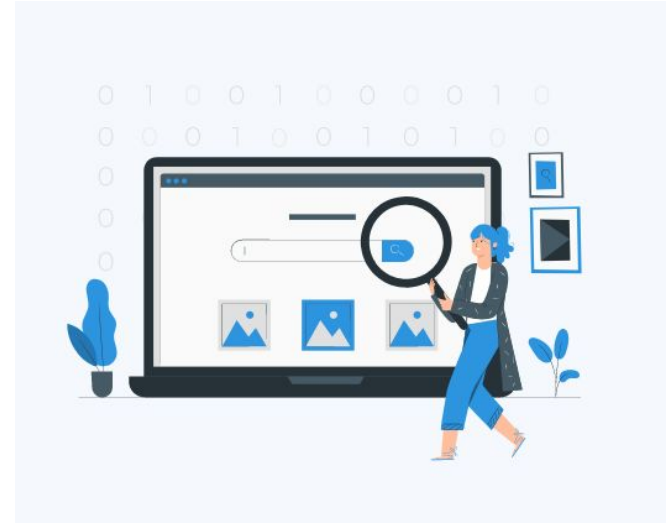


THE START...



Thousands of stored images over the years?

Would you like to see and manage your images in a easy way?



Quickly search by people or content in your images and get the results YOU want

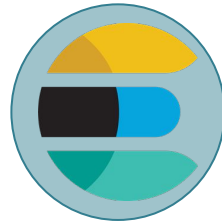
FUNCTIONAL REQUIREMENTS

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- The user shall be able to find images using text.
- The user shall be able to add image folders for processing.
- The user shall be able to find images using similar images.
- The user shall be able to create and delete tags for and from images.
- The system shall be able to perform facial recognition in images to create tags.
- The system shall be able to detect objects in images to create tags.
- The system shall be able to detect patterns in images to create tags.

IMAGE SEARCH BY TEXT

ELASTIC SEARCH



ELASTIC SEARCH

- Retrieves images by given tags with its score
- Order results by score

NATURAL LANGUAGE PROCESSING



NATURAL LANGUAGE PROCESSING

```
Stemming & Lemmatization
words = ["connects", "connected", "strange", "is", "am"]
stemmed = ["connect", "connect", "strang", "is", "am"]
lemmatized = ["connect", "connect", "strange", "be", "be"]
```

- Tokenizes a string
- Removes punctuation and stopword tokens
- Stems each token
- Obtains the Part-Of-Speech tag for each token
- Transforms the Part-Of-Speech tag into the Part-Of-Speech parameter for the lemmatization function
- Lemmatizes each token
- Gets synonyms for each token

NATURAL LANGUAGE PROCESSING

- Allows the user to search for tags, searching for synonyms as well

SIMILAR IMAGE SEARCH

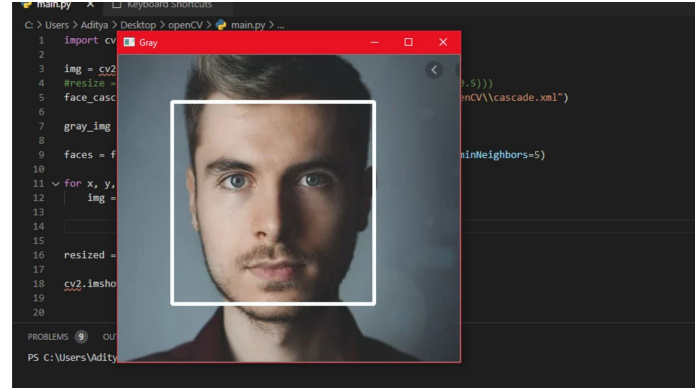
SIMILAR IMAGE SEARCH

- Uses VGG16 of tensorflow to extract features
- Compares the features with other images' features stored in the database

FACIAL RECOGNITION



FACIAL RECOGNITION

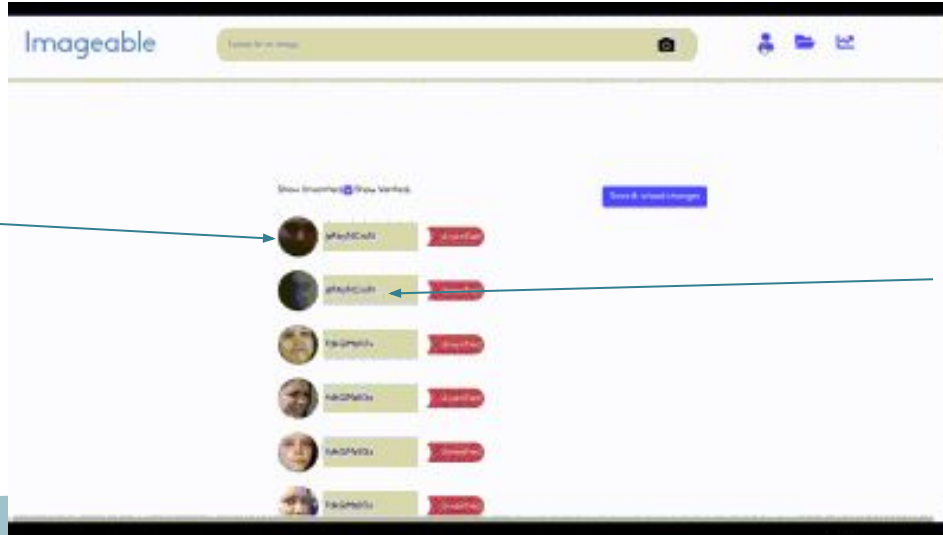


- Detects bounding boxes' coordinates of the faces

FACIAL RECOGNITION

The user can alter the name of a person

Saves a low-resolution thumbnail of the faces



If the face is unknown to the system, assigns a random string to the name property of the new person in the DB

FACIAL RECOGNITION

- The user can search by a person's name



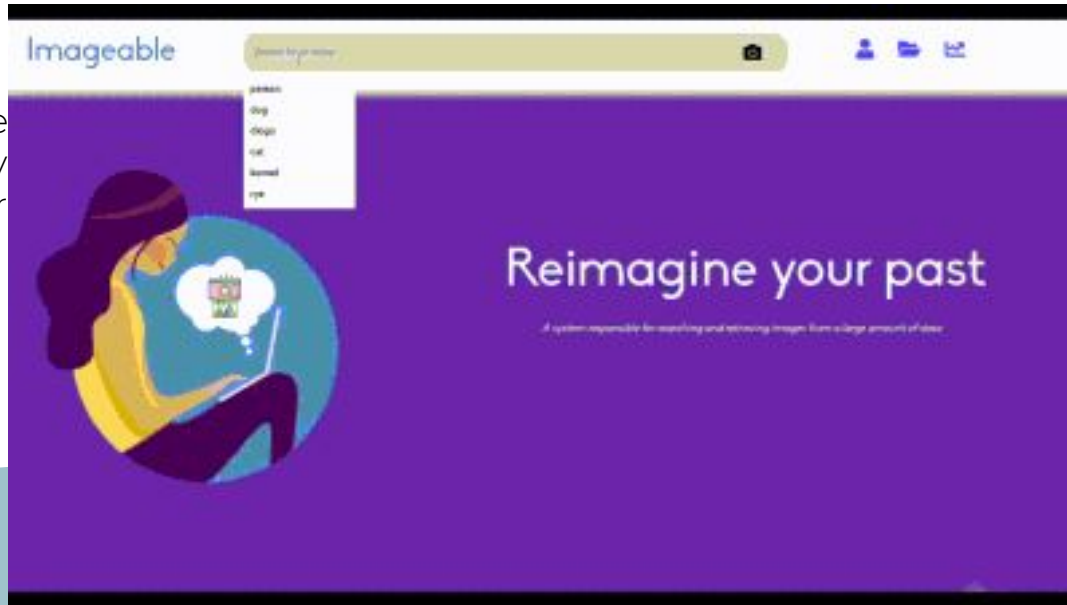
IMAGE OBJECT EXTRACTION



IMAGE OBJECT EXTRACTION

- The user can search by objects

The user can define the accuracy threshold for searches



Creates or retrieves an entity that maps to the object in the DB and associates it with the image

SURROUNDINGS EXTRACTION



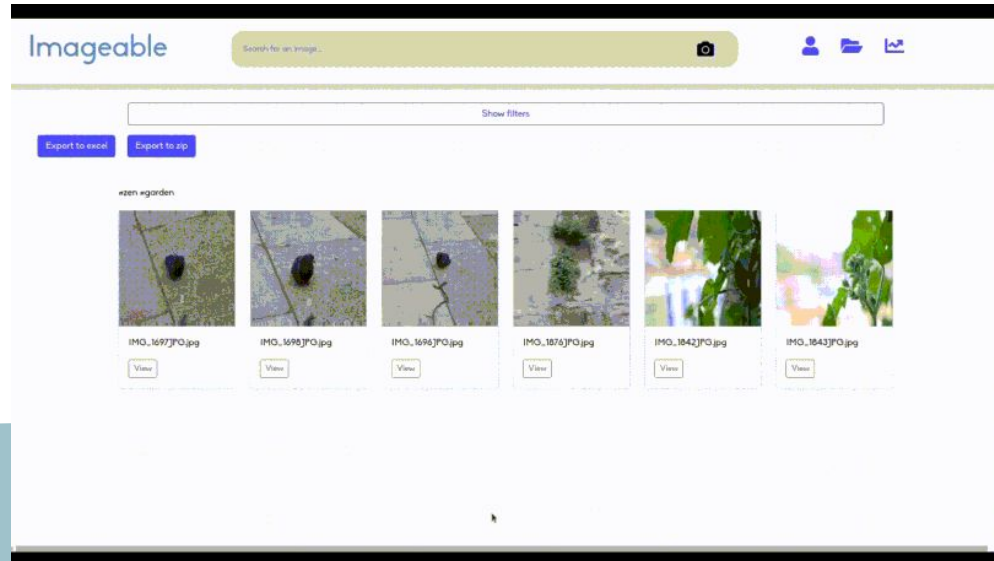
SURROUNDINGS EXTRACTION



- Loads the image converted to the right format for analysis
- Analyses the image and compares the image with the dataset
- Accepts the first 10 results higher than 0.6

SURROUNDINGS EXTRACTION

- The user can search by sceneries and decide which score they want to accept



FURTHER WORK

EXIF

EXIF



- Verifies whether an image has EXIF or not
- In images with EXIF data, extracts datetime, longitude, latitude, width and height information
- In images with no EXIF data, extracts only the width and height information

OPTICAL CHARACTER RECOGNITION



OPTICAL CHARACTER RECOGNITION

- Processes the image, to get better OCR results
- Cuts the image around what it recognizes as text
- Applies the algorithm on processed and cut images
- Applies NLP to filter the results
- Converts the filtered text into tags

BREEDS RECOGNITION

BREEDS

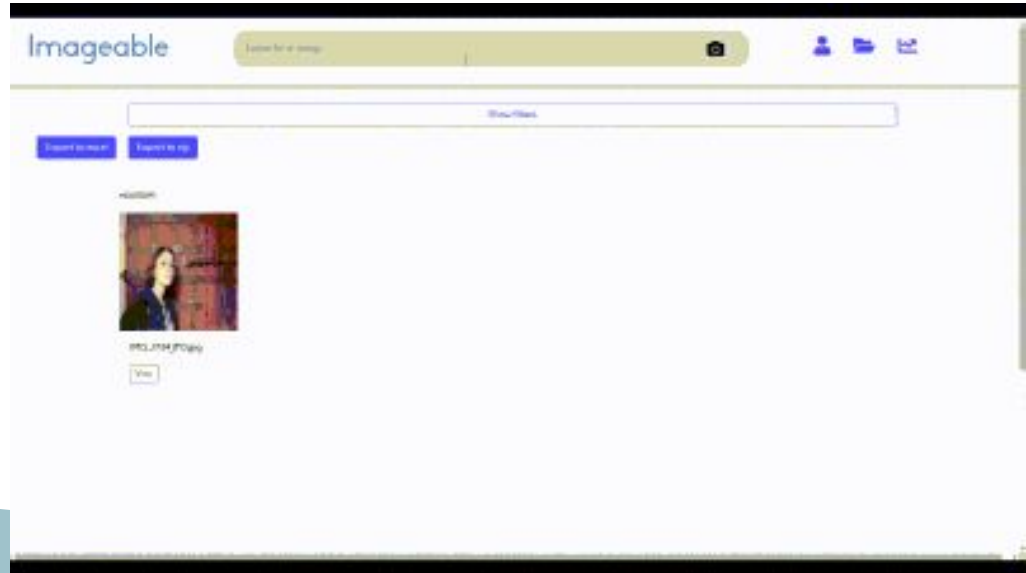
- If the object extraction algorithm detects dogs or cats, a neural network will try to identify the breeds of the pets in the image
- The user can search by 37 different cats' and dogs' breeds

EXPORT

EXPORT

- The user can export all searched images or just a selection of them

The images can be exported to a zip or .csv file



USABILITY TEST

Dados Pessoais

Por favor, assinale o seu género *

☐ Feminino

☐ Masculino

Por favor, insira a sua idade *

A sua resposta

Literacia Tecnológica *

☐ Avançada

☐ Média

☐ Baixa

É fácil orientar-me no sistema

1 2 3 4 5

Discordo totalmente

☐☐☐☐☐

Concordo totalmente

O sistema é agradável de utilizar

1 2 3 4 5

Discordo totalmente

☐☐☐☐☐

Concordo totalmente

O sistema tem algumas características irritantes

1 2 3 4 5

Discordo totalmente

☐☐☐☐☐

Concordo totalmente

Existe consistência na disposição e nos conteúdos apresentados

1 2 3 4 5

Discordo totalmente

☐☐☐☐☐

Concordo totalmente

Sinto necessidade de ajuda em algumas funcionalidades

1 2 3 4 5

Discordo totalmente

☐☐☐☐☐

Concordo totalmente

A utilização do sistema exige conhecimentos mais aprofundados ou experiência prévia

1 2 3 4 5

Discordo totalmente

☐☐☐☐☐

Concordo totalmente

Opinião sobre aspetos específicos do sistema

O tamanho dos caracteres no ecrã torna-os fáceis de ler

	1	2	3	4	5	
Discordo totalmente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Concordo totalmente

A informação mais importante possui um bom destaque

	1	2	3	4	5	
Discordo totalmente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Concordo totalmente

A quantidade de informação que pode ser apresentada por ecrã é adequada

	1	2	3	4	5	
Discordo totalmente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Concordo totalmente

A disposição da informação que pode ser apresentada por ecrã é adequada

	1	2	3	4	5	
Discordo totalmente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Concordo totalmente

Os ícones apresentados são intuitivos

	1	2	3	4	5	
Discordo totalmente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Concordo totalmente

O aspecto gráfico é atrativo

	1	2	3	4	5	
Discordo totalmente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Concordo totalmente



IF WE HAD MORE TIME...

IF WE HAD MORE TIME

- We would enhance the page to edit people's names so that it works well with a big dataset of images
- We would research and implement more algorithms
- We would allow filtering by algorithms, for study purposes
- We would implement Named Entity Recognition in the NLP module
- We would change how the executable runs, to be independent from Python
- We would research how to create a installer