



Similar image search engine

Contact Navee

Mathieu Daviet

mathieu.daviet@navee.co

+33 6 48 01 76 98

Presentation of the Problem

Similar Image Search Engine or **Query by Image content** makes use of the representation of visual content to identify relevant images in large databases. It takes an input image and returns all relevant/similar images.

Such a problem is complex due to:

- the **semantic gap problem**, i.e describing high-level semantic concept from low-level visual features (pixels).
- the **large number of images** to search in.

Input Image



Output Images



Presentation of the Problem

Deep learning models have been very good at resolving this semantic gap problem and can be used to efficiently build a Similar Image Search Engine.

They can extract features from images that are:

- **Accurate**, to find all similar images.
- **Discriminative**, to avoid generating false positive.
- **Compact**, to be able to search more easily in the database.

Tasks to be performed

- 1) Create a **first simple and working version** without any training on the public CIFAR-10 dataset thanks to the utilisation of pre-trained deep learning network (Resnet50, Densnet50 ...). [Here](#) is a well-explained article on how to do this.
- 2) Train more complex **deep learning models** (cf bibliography) to improve the previous model on the same CIFAR-10 dataset.
- 3) Build **an artwork recommendation system** which takes an artwork image in input and return all similar artworks. A much more complex and bigger dataset under the theme of art is gonna be provided by Navee.

Bibliography / Related papers

- To get an overview of the subject:

Recent Advance in Content-based Image Retrieval: A Literature Survey

<https://arxiv.org/pdf/1706.06064.pdf>

- Deep learning model designed for Image Similarity Search

Deep Image Retrieval: Learning global representations for image search

<https://arxiv.org/pdf/1604.01325.pdf>

- A Smart way to create a hashing through Deep Learning

Deep Supervised Hashing for Fast Image Retrieval

https://www.cv-foundation.org/openaccess/content_cvpr_2016/papers/Liu_Deep_Supervised_Hashing_CVPR_2016_paper.pdf