

# Feature Extraction from Sketch Based Images

## [02-SBIRfeatureX-Yahya]

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March 2023

## 1 Introduction

Sketch-based images are often used in various applications such as engineering design, digital art, and animation, where they provide a flexible, intuitive, and efficient way to represent visual information. However, extracting meaningful features from these abstract, less detailed images is a challenging task due to the lack of well-defined edges and textures.

One important application of feature extraction from sketch-based images is the retrieval of relevant images from a large image database. This is a common task in the field of content-based image retrieval, where the goal is to find images in a database that are similar to a query image. Sketches can be used as a query image to retrieve relevant images from the database. This approach is particularly useful in cases where the user is unable to describe the image in words or when the image is too complex to describe accurately. By extracting relevant features from the sketch-based query image, the system can search the database for images with similar features, thus providing a useful tool for image retrieval.

## 2 Motivation

Sketch-based images are a popular and powerful way to represent visual information, but they present unique challenges when it comes to feature extraction. This is because sketches are typically more abstract and less detailed than photographs or other types of images, making it harder to identify and extract meaningful features. Despite these challenges, however, there are many reasons why feature extraction from sketch-based images is an important area of research.

### 2.1 Why is it important?

Because of the increasing use of sketch-based interfaces in a variety of applications. For example, sketch-based interfaces are commonly used in the design of

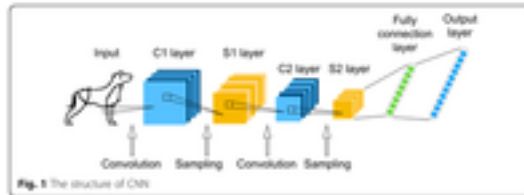
complex engineering systems, where they can help engineers quickly and easily create and modify designs. Additionally, sketch-based interfaces are also used in the creation of digital art and animation, where they can help artists quickly sketch out ideas and concepts. Also, the growing importance of machine learning and computer vision in a variety of industries. Machine learning algorithms are increasingly being used to analyze and interpret visual data, and feature extraction is a key part of this process. By developing more effective feature extraction methods for sketch-based images, researchers can help improve the accuracy and effectiveness of machine learning algorithms in a variety of applications.

### 3 Problem Statement

Extracting meaningful features from such abstract and less detailed images is a challenging task. The main problem with feature extraction from sketch-based images is the lack of well-defined edges and textures, which makes it difficult to distinguish between different objects and their components. Additionally, the complexity and variability of sketches make it hard to identify the relevant features that can be used for further analysis and interpretation. As a result, the accuracy and effectiveness of machine learning algorithms for analyzing and interpreting sketch-based images are limited.

### 4 My Proposed Method for SBIR(Sketch-Based Image Retrieval)

My proposed method to use for developing an application to use sketches as an input query to a search engine to retrieve relevant images from a dataset is Convolutional Neural Networks also know as CNN.



## 5 Deliverables

1. Submit a report summarizing what i learned in the ML course on March 15 and March 22
2. Submit a Data-set summary/report on March 22
3. Submit Progress Reports / Code Results every week starting form March 29 to May 8
4. Submit Test results and report on May 15 and May 22
5. Submit Code review report on May 8

## 6 References

1. SBIR-CNN-MSL
2. Personalized Sketch-Based Image Retrieval by Convolutional Neural Network and Deep Transfer Learning
3. Sketch-Based Image Retrieval Using Novel Edge Detector and Feature Descriptor
4. Sketching out the details: Sketch-based image retrieval using convolutional neural networks with multi-stage regression
5. Sketch Based Image Retrieval by Using Feature Extraction Technique