DIP Project Proposal

Project ID – 5
Project Title: Sketch Based Image Retrieval

Team Members:
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- Chris Andrew (2018701019)

Github repository: https://github.com/Sanny26/sbir

Project Objective:
The aim of this project is to build a system that is able to retrieve relevant and appropriate images when a sketch image is given as a query to the system. The retrieved images may be sketches or colored/digital images. The system will be trained to identify the best possible match for a given sketch image to a subset of relevant images.

Problem Definition:
In a **Sketch Based Image Retrieval(SBIR)** system, a given query sketch needs to be compared with images available in a database to retrieve images that are relevant to the query. This is a special type of **Content Based Image Retrieval(CBIR)** system, similar to the one used in Google's Image search(Search by Image), where an image is used to find similar images in Google's database.

The problem is not as simple as it seems, because of a large number of factors that introduce errors in the retrieval process. Digital/color images vary from sketches in that sketches only contain information about the edges. Comparing this edge information is not always easy and as such we must try and extract features from images that are invariant to color and extract information from the shape of the image. Apart from color, the images in the database will have a large variance in scale as well as the orientation of objects in the image. The features used to compare two images must also be scale and rotation invariant to allow a much more exhaustive search of the database.

We propose the following architecture for the **SBIR** system:

Training

Testing
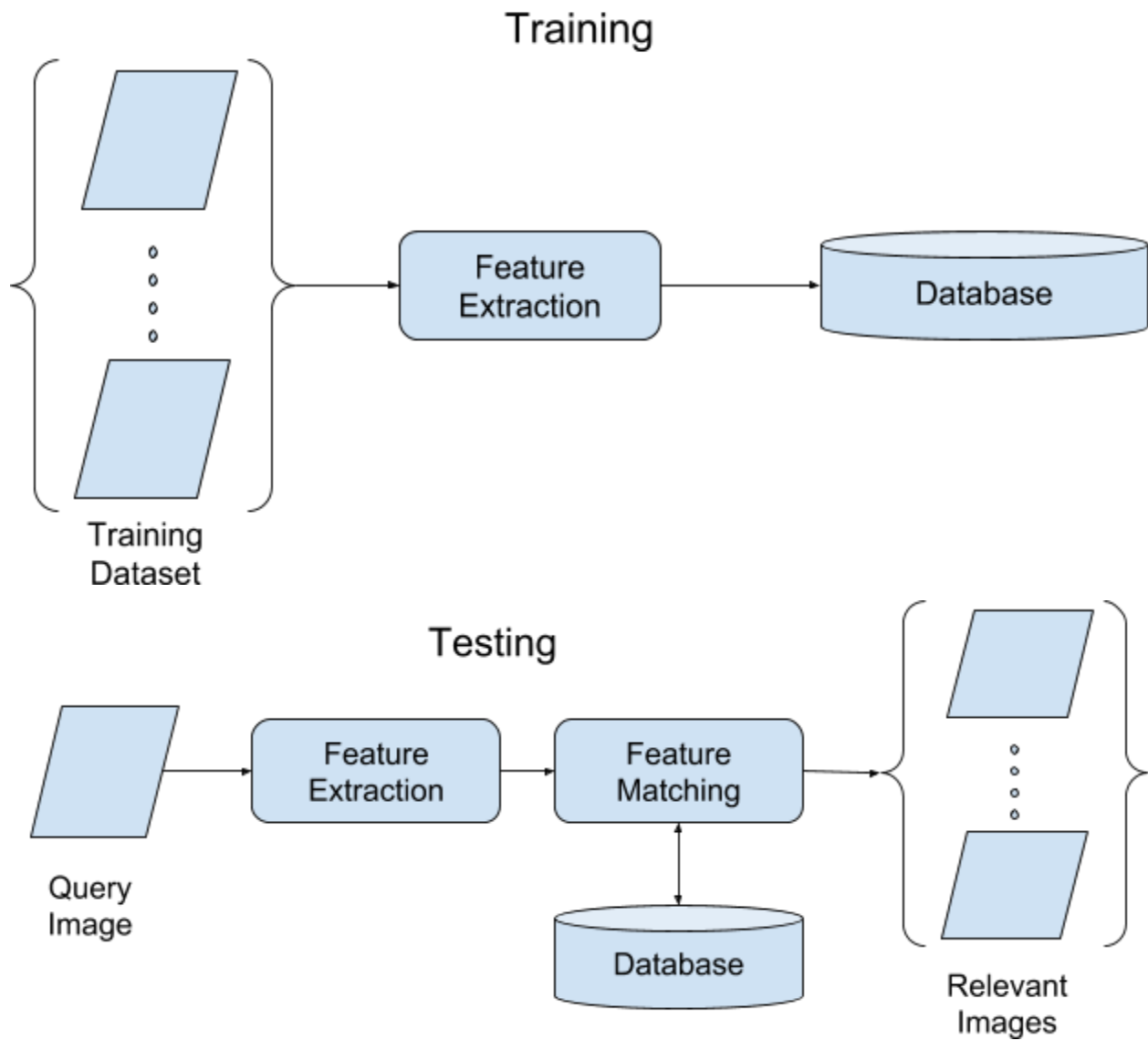
Expected Result:
The final outcome of this project would be an accurate SBIR system, that is able to retrieve relevant images for a given sketch query image with a reasonable amount of accuracy. We will have training and test sets to measure this accuracy of the system. We will also create an interface wherein people can upload their own images to search for relevant images in our database using the SBIR system. For experimentation purposes, we limit the results to 10 retrieved images per query.

Tasks assigned to team members:

Task	Assigned Team Member
Review of the existing methods for SBIR and CBIR.	Chris Andrew
Collection of data for the SBIR system(Also includes pre-processing for noise removal/data augmentation)	Santhoshini Reddy
Finalising the feature extraction mechanism and system design.	Chris Andrew
Implementation of the feature extraction mechanism.	Chris Andrew and Santhoshini Reddy
Incorporate possible improvements and new techniques to improve the quality of the extracted features.	Chris Andrew
Implementation of the feature storage and Image retrieval systems.	Santhoshini Reddy
Implementation of the feature matching mechanism.	Santhoshini Reddy
Experiments to measure the performance of the SBIR.	Chris Andrew
Implementation of the search UI for uploading images to search in the database.	Santhoshini Reddy

Milestones:

Milestones	Tentative date of completion
Review of the existing methods for SBIR and CBIR.	October 7th
Collection of data for the SBIR system(Also includes pre-processing for noise removal/data augmentation)	October 7th
Finalising the feature extraction mechanism and system design.	October 14th
Implementation of the feature extraction mechanism.	November 1st
Incorporate possible improvements and new techniques to improve the quality of the extracted features.	November 7th
Implementation of the feature storage and Image retrieval systems.	November 1st
Implementation of the feature matching mechanism.	November 7th
Experiments to measure the performance of the SBIR.	November 10th - 15th
Implementation of the search UI for uploading images to search in the database.	November 10th - 15th