CBIR - overview

Content Based Image Retrieval - images are retrieved based on their **content**, as opposed to old methods in which images were retrieved using labels and tags.

the **"content"** are Image Features (also called image descriptors). we use two types of features, global and local features. Global features are information that describe the picture as a whole, that is, information gathered by looking on the picture globally (RGB histograms). Local features on the other hand are obtained by focusing on local regions in the picture (SIFT discriptors).

הוראות הרצה:

source init.sh **(if first run)**

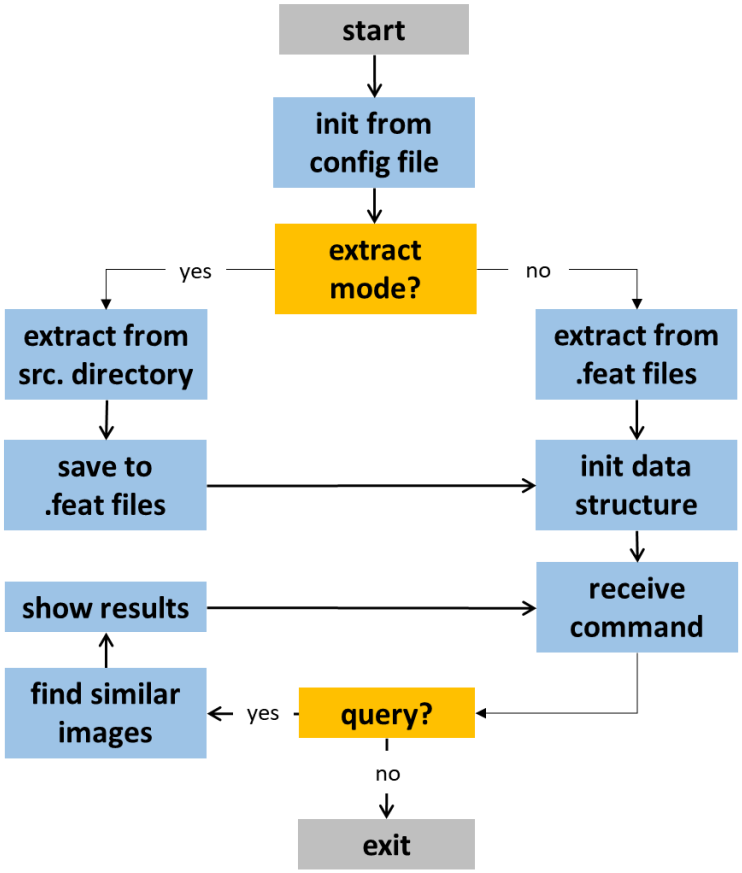
make **(if first run)**

./SPCBIR (for default configuration)

or

./SPCBIR -c <config_file_name> (for configuration from a configuration file)

תרשים זרימה של התכנית:



הסבר על התכנית:

init from config file - initiate all of the system parameter from a default config file, or a specific one.

Before we go to the image retrieving phase, we first need to extract all the features of the images which are in the directory given by **spImagesDirectory**.

However, the extraction of all images features is a heavy process and it could consume a lot of time. Therefore we need to avoid the extraction processes whenever we load our program. In order to achieve this we support two operation modes, ExtractionMode and nonExtractionMode. this value is set by the system parameter **spExtractionMode**.

extract from .feat files [nonExtractionMode**] -** the features of the images are extracted from the features files that we generated in extraction mode.

extract from src. directory [ExtractionMode**] -** extract the features of each image.

save to .feat files - store each of these features to a file which will be located in the directory given by **spImagesDirectory**

init data structure - store all features in a KD-TREE.

receive command - After the preprocessing is done, the program will ask the user to enter an image path. if '#' is entered, the program will terminate.

find similar images - calculate the RGB histogram and Sift descriptors of the query image.

Search using Global Features: For each RGB histogram of the images in the database, the program computes the L2-Squared distances between the query image and the histograms.

Search using Local Features: For each SIFT feature of the query image, the program will search the **spNumOfSimilarImages** closest features in the database (using K-NEAREST NEIGHBOR SEARCH). We will track the number of hits per image in the database.

show results - After the search is done, you should have **spNumOfSimilarImages** indexes of the best candidates for the given query image. To present the result, we support two mode MinimalGUI and non-MinimalGUI, this value is set by the system parameter **spMinimalGUI**.

MINIMAL GUI - display the images one after the other.

NON-MINIMAL GUI - print the result as a string.

[ככה זה הוגדר במטלה]

היררכית הקבצים: