

## PREFACE

Human beings start seeing their surroundings from the age of three months where the retina functions like a camera by capturing the images and thereafter initiates training their brain for image recognition. As the child grows its brain is trained in different methods such as visual, sound, signs, sensing to identify and remember the things. Over years one can see how the child's brain slowly started processing and resulting in learning to search, identify, recognize and remember the information permanently. All these activities are stored in the visual display system of the human brain.

A picture speaks a lot when compared to any other representation. In the field computer science the research area pertaining to digital image processing plays a vital role in applications such as crime prevention, security (biometric + iris +face recognition), medical, legal based on image content retrieval from large database for identification of image shapes. Various approaches are discussed in literature survey

The preliminary study of the topological properties of the image reveals the different methods of identifying the contour of the image. that remains invariant to translation, scaling, rotation. An effort is put to design a new shape descriptor for the image and edge mapping. The content of an image is recognized using a key point based shape descriptor. Template matching techniques are adopted to accurately describe object shapes. The object shape identified is described using histogram vectors.

Further for improving the approach of image retrieval a hierarchical template tree based Content-Based Image Retrieval system is designed. In hierarchical approach a combination of low level features and shape features are used. Every template is constructed with shape and low level features. Templates of similar categories are further decomposed to form a hierarchical template tree. Query image is converted into a query template and is decomposed. A part template based matching scheme is used. Support Vector Machine and K-Nearest Neighbor classifiers are used to validate the shape feature with the aid of Manhattan distance metric. For proving the superiority of the work it is simulated on OpenCV and MATLAB and, compared the obtained result with J.J. Chen et al. [25] system.