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Association Rule Mining over Medical Image Dataset: A Survey Approach

Nishtha Parashar¹

Department of CSE & IT,
Madhav Institute of Technology and Science, Gwalior,
M.P., India
nishtha2909@gmail.com

Dr. Akhilesh Tiwari²

Department of CSE & IT,
Madhav Institute of Technology and Science, Gwalior,
M.P., India
atiwari.mits@gmail.com

Dr. R.K. Gupta³

Department of CSE & IT,
Madhav Institute of Technology and Science, Gwalior,
M.P., India
iiitmrkg@gmail.com

Abstract – In present world due to digital revolution a huge amount of digital photographs, satellite imagery, and medical images are being generated every day. Due to the generation of very large number of images on a vast scale; the process of analysing and diagnosing images has become critical. As a consequence, there is a growing need for Image Mining systems, which serve the purpose of reviewing semantically meaningful information by design and extracting knowledge from large amounts of image data. In contrast to Image Mining, Association Rules are often used to represent frequently occurring patterns that occur together in similar type of images and these rules, can be used further for effective mining of images. This paper aims at comparing various techniques used for mining of images and thus the current state of Image Mining using Image Data Association is reviewed, providing directions for future research in the arena of Image Mining.

Keywords – Image Mining, Association Rules, Feature Extraction, Knowledge Discovery

I. INTRODUCTION

In present world due to digital revolution a vast amount of medical images, satellite imagery and digital photographs are being generated on a daily basis. Information that is of use can be extracted and publicized to the human users by carefully examining these images. Thus, image analysis deals with mining meaningful information from images; predominantly from digital images by means of techniques in digital image processing [1] that tend to segment the pixels in a digital image based on their density or color. The image then segmented is used to quantitate an area (defined by pixels) of specific features.

Due to the generation of large number of images every day, the process of analysing and diagnosing images has become critical. Therefore, there is a demand for

“Image Mining” systems, which serve the purpose of reviewing semantically meaningful information by design and extracting knowledge from large amounts of image dataset. Extracting implicit knowledge and relationship between image and data that is not explicitly stored in image is what Image Mining is about [2]. Unlike, other image processing technique the aim of image mining is not to detect a specific pattern in an image. The focus is rather on identifying image patterns and originating the knowledge from images within a large collection of image dataset based on the low-level pixel information.

In contrast to image mining, *Association Rules* are used in representing frequent patterns that follow together in similar type of images and these rules, can then be used for further effective image mining [5]. The most discerning features during the mining process are used in order to get the *strongest association rules*. Thus, the image mining algorithm becomes faster due to the use of feature optimization for choosing most discerning features and feature discretization.

Next subsection introduces the concept of image mining along with the detailed description of its various phases.

II. BACKGROUND

A. IMAGE MINING

Image Mining is the practice of probing and discovering information and knowledge that is of value in large volumes of image data [2]. Image mining deals with the extraction of image patterns from a large collection of images. A contrast can be drawn between image mining and low-level image processing techniques because image mining emphasizes on extracting patterns from huge collection of images, on the other hand the focus of image processing techniques is in understanding and/or finding specific features from a single image [14].