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Image Mining Process and Techniques Using Association Rule – A Survey

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Abstract: ***Image mining pertains to eradicate the image patterns from a sizable assemblage of images. Image mining is an augmentation of data mining to image domain. It goes moreover the complications of striving the correlated images. Association rule mining is a data mining process. It is an action which is to search expected patterns, association are found in different kinds of databases such as relational databases, transactional databases and so on. In this paper, we explore various images mining processes and techniques based on association rules.***
Keywords: Image Mining, Association rule, Image mining process, Image mining techniques, Databases.

I. INTRODUCTION

Data mining is to figure out the complications through data analysis for extensive data combinations. It is the outgrowth of categorize the equivalent or applicable facts from spacious data sets[9]. Data mining uses cultivated mathematical design to sector the data and criticize the contingency of forthcoming advents. Data mining applications are vastly used in health care sectors, research and market based analysis, weather forecasting and so on. In the area of data mining, image mining is confide to a progressive area for emerging data relevant to the images. Image mining pledge with the separation of image patterns from a vast assemblage of images [5]. Image partition is the elementary phase in image mining. It is the mechanism of fact finding and observing collectible data and information in enormous information. Association rule mining is a data mining process where it is used to predict the numerous patterns, association and correlation from datasets where found in different types of databases such as relational database, transactional database etc. Association rule generates to find frequent item sets. These frequent item sets are used to form rules with the minimum confidence constraint [14].

II. LITERATURE REVIEW

Ji Zhang, Wynne Hsu and Mong Li Lee, in image mining, there is difference from low level computer vision and image processing technique where image mining is extracting patterns from large database of images and computer vision and image processing technique is extracting from a single image[1] . Farah Khan and Dr. Divakar Singh , Association rule describes that how the objects aim to group together. It can be defined in abundant ways which can be followed according to the value types [2]

III. IMAGE MINING PROCESS

In the field of data mining, image mining is an extended path in the field where it conclude basic algorithms from concepts in large databases. Image mining process can be clarified according to four: preprocessing, transformation and feature extraction, mining, interpretation and evaluation and knowledge[5]. This process will done step by step to eradicate the thorough knowledge of mining. This image mining is a fast challenging and outgrowing area in the researches.

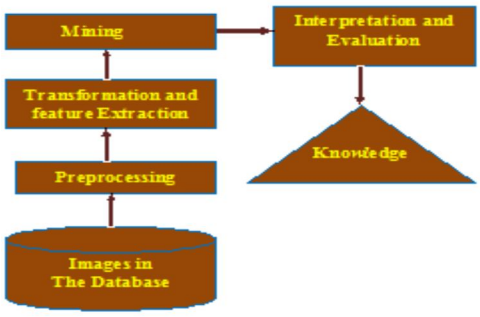


Fig1. Typical image mining process

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A. *Preprocessing*

Preprocessing is an activity with the images where it is consider to be a least level of depth images of both input and output. The main aim of this preprocessing is an improvement of image data that break down or strengthen some important image feature for further processing[2].

B. *Transformation And Feature Extraction*

This is to transform and fetching important and non redundant features from raw data .In feature extraction, it is usable to recognzed disconnect the different characterization shapes of images or video streams[5].

C. *Mining*

Image mining is a process of extracting patterns, accurate knowledge and image data relationship are collectively found in the huge database collection of images[3].

D. *Interpretation And Evaluation And Knowledge*

After all this process patterns are finally evaluated and interpreted the knowledge that is required. This can be used to predict and make profitable for an individual or an organization[2].

IV. IMAGE MINING TECHNIQUES

Image mining is to determine valuable facts and knowledge from huge volumes of data. Image mining techniques include object recognition, image indexing and retrieval, image classification and image clustering[5].

A. *Object Recognition*

It is a process to find or identify a particular object in a digital image or video. It is also used to detect and track 3D objects[12]. This is mainly used in disease identification in bio imaging. This object recognition principle commits on matching and learning.

B. *Image Indexing And Retrieval*

Image indexing is also named as description or text based images. It is actually used to admit keywords, subject headings, captions, or natural language text. An image retrieving is used for browsing, searching and retrieving images from a large database of digital images[7].

C. *Image Classification And Clustering*

Image classification is used to classify the objects detected to the images. Currently different approaches have been proposed and tested. To categorize an image supervised classification approach is needed[12]. Also clustering represents unsupervised object categorization.

V. ASSOCIATION RULE

Association is a spatial relation between attributes, things, outcomes, occurrences etc. in data mining association indicates logical dependency between various attributes of an entity. This attributes are found by association rule mining[15]. Association rules connects object together and group together. Specified parameters can point out the associations in the association rule mining[9]. Various algorithms have been proposed for association rule mining where Apriori algorithm, FP Tree growth algorithm, Pincer search algorithm, Partition algorithm etc.

A. *Apriori Algorithm*

Apriori algorithm is a one of the acceptable algorithm in data mining. It is used to mine frequent item set and related association rule and to operate a database containing lot of transactions, items brought by customers[15]. Apriori algorithm permits bottom up, width search method, it include all frequent item set. when the database is scanty, subsequently frequent item set will be short. Apriori algorithm and similar algorithm can get favorable properties under this condition[16]. This algorithm has been accomplished into two steps where,

1) Frequent items in a database should be Find first.
2) These frequent item sets and confidence constraint are used to form Rules[2].

B. *Fp Tree Growth Algorithm*

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Frequent pattern growth method can be used only with the databases. Here the number of databases are divided into two[14]. Main idea of FP-Tree is to partition and consider the databases which provides frequent sets then convert the divided databases into set of conditional databases where each can be related with frequent set[16].

C. Pincer Search Algorithm

Pincer search algorithm is used for storing frequent item sets. This algorithm is very efficient for innovating number of frequent set. This algorithm has such applications which determine association rule, strong rules and minimal keys[14].

D. Partition Algorithm

Partition algorithm is a gathering of trees. Partition makes one tree for each block. To represent the partition as a vector with the need of parent information. In many applications to develop a partition by initializing with the least partition[16].

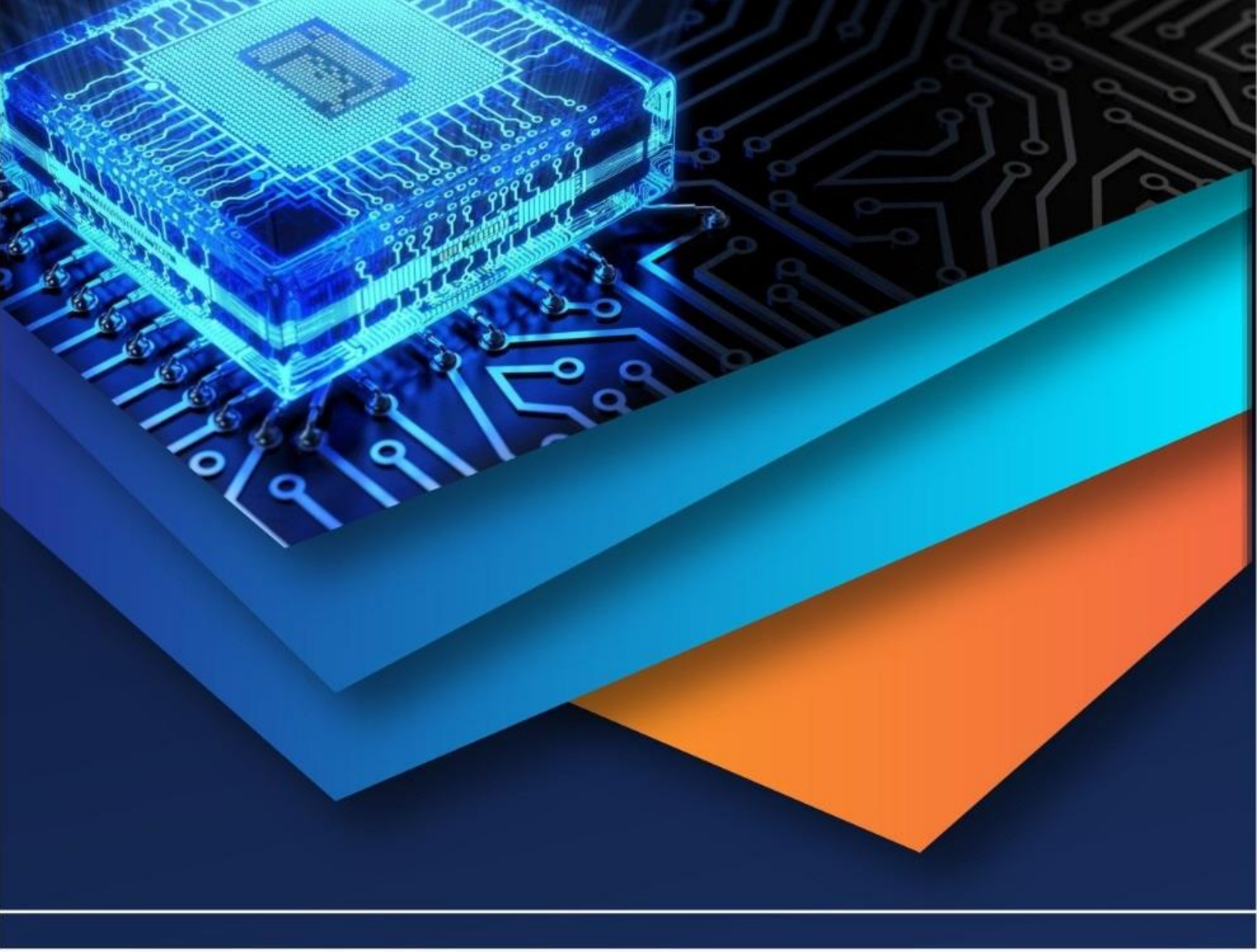
VI. CONCLUSION

In this paper, we have highlighted image mining process and its techniques with association rules and were discussed. Comparing these concepts we choose the one of the best method and evaluate with any of the real time application. By using this image mining concept using any one of association rule mining algorithm we can either use these areas: medical sector images, agricultural images, weather forecasting images and so on.

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