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Optimized Image Processing using Big Data Dynamic Handover Reduce Function (DHRF) in Cloud - Review

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ABSTRACT

Processing of hard task like this can be solves by using the concept of Hadoop, Map Reduce .Hadoop is a framework that allows to process and store huge data sets. Map Reduce is a programming model which allows you to process huge data stored in hadoop. Map is a concept of splitting or dividing data and Reduce function is the process of integrating the output of Map's input to produce the result. The Map function does two various image processing techniques to process the input data. Java Advanced Imaging (JAI) is introduced in the map function .The processed intermediate data of the Map function is sent to the reduce function for further process. The Dynamic Handover Reduce function (DHRF) algorithm is introduced in the Reduce function. This algorithm gives final output by processing the Reduce function. MapReduce concept and proposed optimized algorithm is made to work on Euca2ool(cloud tool) to produce an effective and better output compared to previous tasks in field of Big data and cloud computing.

Keywords -Hadoop, MapReduce, DHRF, Euca2ool, Cloud Computing

I. INTRODUCTION

Hadoop is an open source framework which is used to processing on large data sets. Many times hardware failures are occur and it will be handled by Hadoop framework. Hadoop image processing library provide solution to store large amount of images on Hadoop distributed file system. This library provides the implementation with opencv (open source computer vision library).Hadoop working with different demeans such as name-node is run on master node. Data-node is runs on Slave-node. The Name node instructs data files to be split into blocks, each of which are replicated three times and stored on machines across the cluster. Client machine is responsible for loading data into the cluster. It will submit Map Reduce jobs and viewing the results of the jobs. Job-tracker tracks jobs which split into cluster. The Task-tracker accepts tasks from the Job-Tracker. The reduce phase extract image stored in HDFS the specific processing in shown figure 1

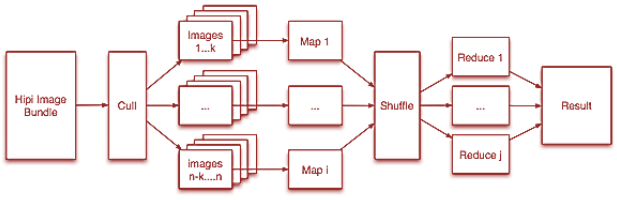


Fig 1 Hadoop Image Processing

Hadoop image processing interface library designed is used with parallel programming framework. It provide how to storage a large collection of images on Hadoop distributed file system and make available or efficient distributed processing and it is integrated with opencv a popular open source library. The HIP Image is base class provide to the underlying grid of pixel image value as array , bytes and floats, respectively. it provide a number of useful function like crop, color space and conversion and scaling.

1. **Hipi Image Bundle:** It is open source framework. It maintained by a group of dedicated researchers and developers.

2. **Cull:** The initial stage of a Hadoop image processing interface program is a culling step that allows filtering the images in a Hadoop based on a user denied condition are used in spatial resolution and criteria related to the big data.

3. **Images:** The primary presentation for a collection of images on the Hadoop distributed file system. Map reduce is optimized to support efficient processing of large file system. HIB is actually compared two file stored on the system.

4. **Shuffle**: shuffle can start before and after map phase has finished to save same time. Reduce status is greater than 0 percent but less than 3% when map status is not yet 100%.

5. **Mapper:** Take the data and convert into another set of data where Individual elements are broken down into tuples.

6. **Reducer**: Take the data from mapper and combine those data tuples into smaller set of tuples.

II. Data Processing

In the proposed work, two various types of image processing techniques are applied for the input (Big Data) as shown in the Fig.3.The first technique is the combination Grayscale and Sobel edge detection. The second technique is the combination of Gaussian Blur and Fast Corner detection method. The Grayscale conversion is the best method to convert the original image into Black and White image and Sobel edge detection is the method of detecting the edges of the images

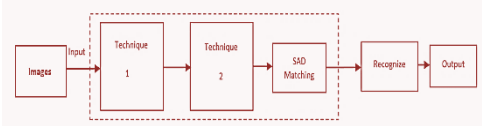


Fig 2 – D9ata processing techniques

Gaussian Blur is the best blurring technique ever, used here to blur the input image. Finally the Fast Corner Detection technique, since that is the best technique. After the completion of both the processing, the data is then transferred to the next level of Matching called SAD matching. Then the integration of the intermediate data is done to recognize the output

III. DHRF

DHRF (Dynamic Handover of Reduce Function) is an algorithm implemented in the proposed work. The function of this algorithm is to reduce the waiting time during the Reduce function. The work of the reduce function is to integrate the processed data. Two sets of image processing techniques are applied on the intermediate data such as Grayscale, Sobel, Gaussian and Harris Corner detection. These techniques are applied on the spitted data which are produced after the application of Map function. Each and every intermediate data are applied with two techniques.

```
BufferedImage
res = new BufferedImage(width,height,BufferedImage
.TYPE_BYTE_GRAY);
 // Initialize the image process
  byte[]bytesCompressed=compressor.compress(image
toCompress);
```

```
Deflater deflater = new Deflater();deflater.setInput(bytesToCompress);
//Produce the data compression
 BufferedImage resizedImage = new BufferedImage(IMG_WIDTH, IMG_HEIGHT, type);
Graphics2D g = resizedImage.createGraphics();
g.drawImage(originalImage, 0, 0, IMG_WIDTH, IMG_HEIGHT, null);
g.dispose();
// put the data into scaling
 Static{
URL.setURLStreamHandlerFactory(new FsUrlStream HandlerFactory());
} // write the map reduce structure
 in = new URL(PATHTOBEMAPPED).openStream();
IOUtils.copyBytes(in, System.out, 2, false);
//set the server to handle mapper
FSDataOutputStreamout = fileSystem.create(path);
InputStream in = new BufferedInputStream(new FileInputStream(new File(source)));
// mark data into HDFS of Hadoop
Process the image until completing the grayscale,sobel, guassian, fast corner, SAD matching of the image.
 // operate the data process until the data processed
map(in_key, in_val) -> list(out_key, intermediate_val)reduce(out_key, list(intermediate_val)) -> list(out_value)
//Set the MapReduce Operation
FileSystem fs = file.getFileSystem(context.getConfigur ation());FSDataOutputStream
fileOut = fs.create(new Path("your_hdfs_filename"));
// write the data mapper
reduce(WritableComparable,
Iterator, OutputCollector, Reporter)
 continue until reducer task is complete
 // send mapper output data to reducer
 JobConf.setNumReduceTasks(int)
 // set small unit value to the task and reducer wait queue
interrupt.task
store the result(image).
```

When the image is processed by the template, the image is compressed and scaled then produces the Map functions. In the first set of Grayscale method, it delivers the image in black and white without noise disturbances. The Grayscale image output hand over's the edge detection technique to the next process. It removes the outer layer of noise disturbance. So enhancement of the best edge detection technique called Sobel edge detection technique is done. Then the implementation of Gaussian blur reduces the image noise. It is for pre-processing stage for any image enhances structure. So the retrieval of formal blur image can be used for the detection of corners. The corner method defined as a point of two different edge directions and dominant. In this, corner detector works uses only a segment test, so the result is very accurate and quality at the mean time of time reducing in the .jpeg format.

Finally Map function results are sent to reduce operation. The implementation of DHRF algorithm focuses on Reduce function integrating the task and allots the process to produce the result .Jpeg format. In Reduce function, it involves the small unit of value for determining the task and sequentially it completes the process. Whether the process is completed, it produces the result .jpeg format.

IV. Proposed methodology

Euca2ool is a Cloud tool that is private cum hybrid Cloud Tool. Though there are many tools to solve the problems in big data..This enhanced tool will definitely give the better result in both the time and cost estimation. Basically Hadoop is enhanced of HDFS and MapReduce function. Since the MapReduce function is an open source, the codes can be edited and modified. The coding is edited now in the Map part. The coding is made in such a way that, the inputs are split into maximum of ten parts. Sothat the Map function will be easy while processing. This change in the Map function will reduce the

processing time.The coding or the application set up of the image processing techniques is installed on the Euca2ool, to run the experiment.Basically Map is the primary function in the process of Big Data. Splitting the data into maximum number of part is called as MapFunction. In the proposed work, Pre-Map concept is implemented. Pre-Map is the concept of Map the Map function. The situation in which, when the Map function is proposed to do, the data will be mapped before the Map function into maximum number of parts.

a) *How Cloud Computing is involved in Image Processing*

The HDFS is used to store, retrieve and process the data. Few image processing techniques are used in the cloud computing. Since, Big Data is referred to the context called image/data. When the data is taken as the input, it is made to undergo the Map Function. The function of the Map function is to Split the data into maximum number of data called as intermediate data. Those intermediate data are split to process further. Two set of image processing techniques are used in Cloud Computing.

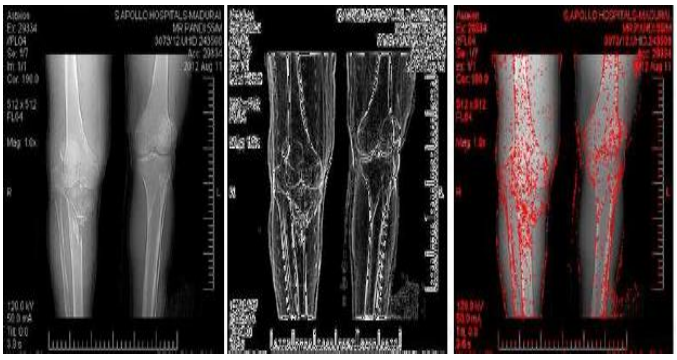
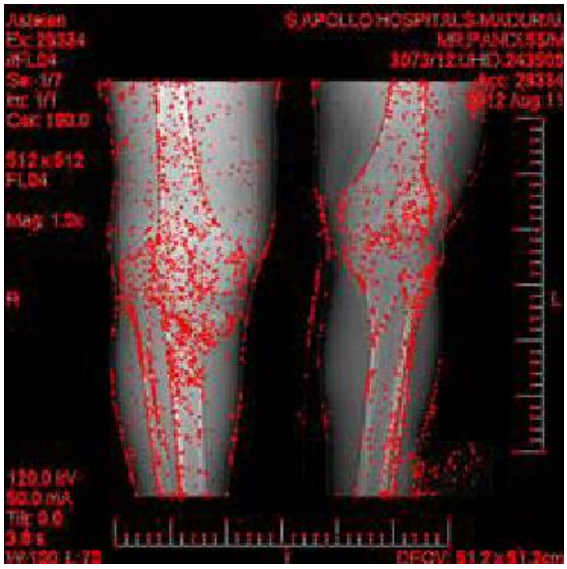


Fig 3 Results

JAI does the task of converting the data. Either the data may be a structured or unstructured one. By using the JAI, the data are converted to structured data. Fig 4 shows the results of obtained from the data processing techniques. Further, the inputs are processed first with the Pre-Map technique. Pre-Map technique is used, to split the data before sending the data to Map function.This Pre-Map function split data in to maximum number of parts, in order to reduce the processing time during the Reduce application. After the function of Pre-Map and Map Function gets over on the Data, the data are set to intermediate data. The Map function is done by the client machines. These intermediate are made to undergo the two set of image processing techniques. To avoid the waiting time, the Dynamic Handover Reduce Function (DHRF) is applied on each and every intermediate data. This results in the output of the input (Big Data).

V. RESULT

Fig 4 shows the result of the Fast Corner method. In this figure, the sharp edges and the damaged parts are pointed out sharply. The red mark shows the infected corners. When compared with the Harris corner method in the existing work [2], this is proved to be the best corner detection. The application of the two image processing techniques, gives the expected result



The result shows the sharp edge and damaged part through Fast Corner method The Fig 5 graphical representation is betweenthe estimated time and total number of Machines. In theproposed system,

the taken to process the image iscomparatively less than that of existing system.

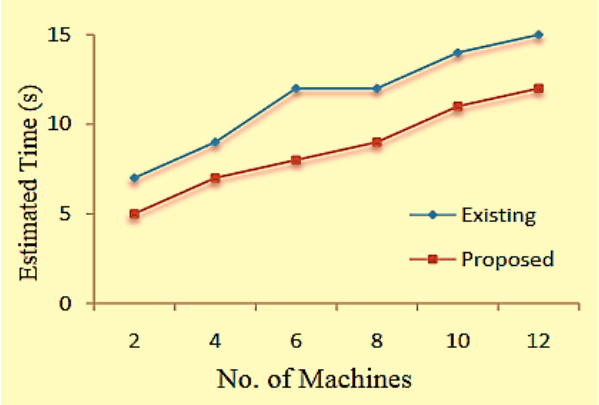


Fig. 5 Proposed and existing techniques

finally, this Fig 6 shows the graphical representation between Existing Map function with the Proposed Map function. In the existing Map function, the data will simply just get splitted in the normal way. But in the proposed system, we have introduced Pre-Map technique, it basically Maps the data before sending to the Map Function. By default the data processing will be simple. This is graphically explained in the bellow picture.

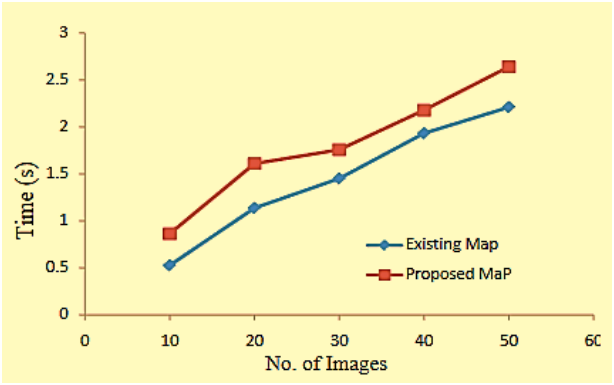


Fig 6. Effect of mapping techniques

VI. CONCLUSION

This proposed system, the image processing techniques have reduced from four to two image processing techniques, with proposed an optimized scheduling algorithm. This work resulted with waiting time and error percentage. An application of JAI and pre-Map technique with hadoop over Euca2ool results with far better results in entire when compared with the existing system. Further, our research works will be an application of scheduling over heterogeneous networks for scheduling and resource allocation.

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