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Conversion of Image processing data of pipeline analysis using Machine learning Algorithm

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Abstract— *In the field of image analysis and processing, the post section of having a data record plays a vital role. The research work carried out for analyzing a crack image in an oil pipeline titled "**Image Analysis and processing using mathematical morphological operators and high frequency filter for pipeline crack measurement"** had a difficult phase of saving the data for future study. To overcome this issue a technique to preserve the image data is handled with the concept of big data analysis. A pipeline scanned for quality maintenance sends numerous pictures, where the pixel data is converted to binary data and then these are calculated using the mathematical morphological operator based on erosion and corrosion of the images. These data are saved for further reference where the normal method of data saving using any hardware device was a big threat for loss of data and the cot to maintain the system is too high. To overcome this issue image data is been tried to save through the big data technique.*

Keywords— Bigdata, Cluster Analysis, Machine Learning, Prescriptive analytics, Supervised Learning.

I. INTRODUCTION

"Modern Machine Learning is devoted to deriving value from data, not jamming the airlocks."

Arthur C Clark's the above quote is to be proved soon, using the Big data enabled Machine Learning. Image processing can be analyzed using Machine Learning based methods like clustering and classification. Clustering methods helps to learn the relationship of image intensities for segmentation without the concept of domain knowledge. Image specifying features are taken to analyze the pipeline crack. Large volume of data is required for tough cracking images against imaging relics, intensity and also for shape variations. On the other hand Classification methods help to learn from the sample or training data given. This method is performed by the data set generated from the digitized image of a crack.

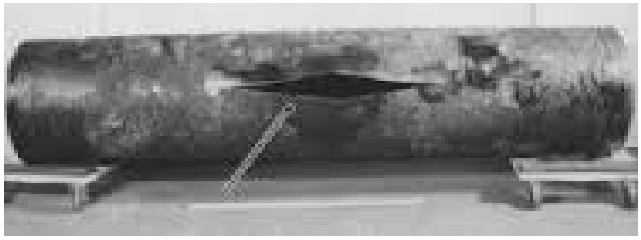

Fig.1: Pipeline image with a crack (pic courtesy Engineering Mechanics Corporation of Columbus)

In the implementation of Machine learning Approach algorithm either supervised or unsupervised algorithm can be applied. But as far as this research work is concerned supervised learning with cluster analysis technique has been implemented. So it is best to follow the supervised machine learning technique to extract the data from the cluster images of cracked oil pipeline. The new development in modern computers has helped to exhibit systems with good performance and storage capacity. Machine learning system is used to learn data from the past to the current and helps in a comparative study of the data available. This is carried out by the effectiveness of a machine learning model depending on the high speed, volume and high variety of data and big data helps perfectly to carry out the task.

In this research paper the task of converting the existing binary data storage to big data through machine learning is to be achieved.

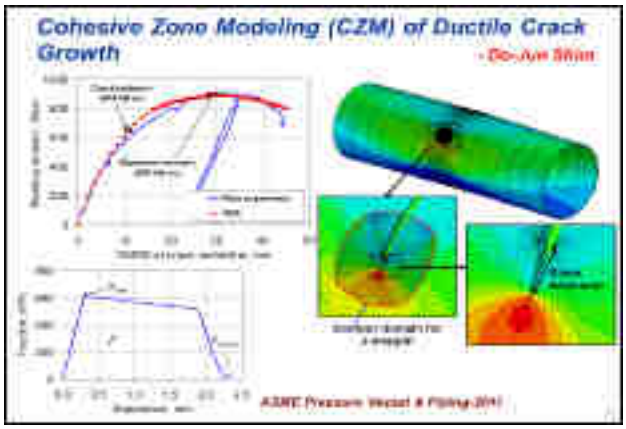

Fig.2: (pic courtesy Engineering Mechanics Corporation of Columbus)

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II. BIG DATA

Big data means a massive volume of data that consists of both structured and unstructured data that is too large to process using normal database and software techniques.

Image processing of a pipeline deals with volume of data than the usual capacity of holding both the past and current values of the captured image.

Big data analytics extracts meaningful patterns from massive input data from the image analyzed for decision making and predictions.

III. MACHINE LEARNING

Machine learning is the modern science of finding patterns and making predictions from data based on work in any kind of image processing methods where the volume of data is too big.

Big data is implemented with Machine learning methods on image data where deep and predictive insights need to be uncovered from data sets that are large, diverse and fast changing. Machine learning easily identifies the dataset when compared to the existing traditional methods.

When Machine learning algorithm and big data are combined they do predictive analytics, deep learning, prescriptive analytics, and machine learning. Image analysis and processing for a pipeline with a large set of data helps to make a clear and effective data set to identify the cracks in the image at ease.

The ability to automatically apply complex mathematical calculations to big data in any type of data repeatedly and quickly is the recent application in the field of big data and machine learning. This definition helps to reconstruct the data model in the research paper of "**Image Analysis and processing using mathematical morphological operators and high frequency filter for pipeline crack measurement",** where the mathematical morphological operated data from the cluster image is processed using the big data and machine learning concept. This is a big revolution in the image analysis and processing field where the data for future use will be preserved for any further requirement.

IV. METHODOLOGY

To design an efficient machine learning system, the data from the image should be recognized efficiently. Algorithms to be implemented should be the best fit. Automation and iterative processing should be effective. Scalability should be measured accordingly to know the progress of the implementation and overall it should be an ensemble model.

V. CONCLUSION

The Machine learning model designed with big data helps to maintain a good track of the data that is analyzed using the image from the pipeline. This paper will be implemented with 5,000 sample sets of data taken from image and then later depending upon its successful performance the sample set will be doubled or increased more to get a faster and effective result.

In the overall performance of this method of sample treating has paved way for more applications through big data and machine learning .

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