

# “COMPARISION ANALYSIS OF FEATURE EXTRACTION FROM THE ECG GRAPH REPORTS”

Mr.Raghukumar B S<sup>1</sup>, Dr.Naveen B<sup>2</sup>

<sup>1</sup>Research scholar, Dept. of ECE, BGS Institute of technology, Adichunchanagiri University, BG Nagara, India.

<sup>2</sup>Associate professor, Dept. of ECE, BGS Institute of technology, Adichunchanagiri University, BG Nagara India.

## Abstract

Predicting the explanation and rate of exactness on heart attack from ECG reports is a significant issue. The robotized examination strategy will age out the issues of common people in understanding the reason for heart attack. This methodology has put a genuine conversation stage for the investigation of a Content-Based Image Retrieval System (CBIR) for ECG reports. As the energetic development of securable picture data and a most extreme necessity

for information documentation ordering and correction, numerous researchers, specialists, and researchers worked a great deal on the ECG chart report. This paper offers a similar examination of the few procedures and techniques that were utilized and applied to remove features from ECG chart reports. Correlation examination will support the looks into and researchers to pick an appropriate strategy or technique for future extension.

Keywords: ECG reports, feature extraction, heart attack, CBIR.

## 1. Intrduction

The information helps in data assembling and changing over it from the unstructured to a composed structure. The way toward separating the data from pictures helps in recognizing the heart attack, which gives some valuable data during the respiratory failure identifying process. Data recovery can likewise be utilized in ECG reports handling to recognize and confirm the illness. Among all element extraction from ECG reports innovation stands first as the significant stage in dissecting the circumstance, evacuate foundation in

the picture, and finding the breaks found in the pictures. The system of separating data isn't as simple as reviewing the pictures. The procedure incorporates different basic stages including a detachment of foundation from the frontal area deduction. The substance in the pictures will be changed over into various bundles dependent on the part of the intrigue. Pixels that are available in the sign will be considered as the frontal area and the reaming data will be considered as a foundation to bifurcate with the real and other data to be removed. Strategies like Otsu's, cross-connection, phase pictures properties, autoregressive, and wavelet

transform, Eigenvector, fast Fourier transform, direct prediction, free part investigation, and false neural system are most usually and consistently utilized techniques for feature extraction from ECG reports. Notwithstanding, the innovation has become broadly still there are some trying regions where the mistake rates are essentially high in include removal from ECG graph reports. To explore the difficulties obstacles and to refresh the explanations behind these, the creators have done a thorough examination of all the extricating methods and attempted to give the explanatory similar outcomes. This paper additionally gives the centrality of the examination, the significance of strategies and algorithms utilized for different purposes in the field of feature extraction from the ECG reports. The outcomes got by different researchers and examines will help us, later on, to take exact choices in conquering the disadvantages found in the past research works.

## **2. Techniques observed are yet continued, expanded, or diminished?**

In the above the patterns have been energetically expanded as the innovation developed with the generation change. Prior the component extraction procedure was utilized to simply recognize the irregularity of a heart however now feature is being separated in disease detection, heart abnormality treatment, background scenarios of the pictures, video investigation, etc the absolute best algorithms utilized in the present pattern have been quickly clarified in this segment. ICA (independent component analysis) and Adaptive sifting (Christian Wiede et al., 2016), this technique expect that our perceptions are a direct blend of the autonomous sources; subsequently it is called blind source separation. At that point, versatile channels are utilized to dispose of false recognition showing up in the structure abrupt changes in the pulse. This

accuracy is less, needs to be improved for accurate measurements. ECG abnormality detection algorithm (Soha Ahmed et al., 2017) depends on cross-correlation theory which identify the abnormalities. Which perform the comparison of the ECG cycle obtained with predefined values, a drawback is requiring large processing time. Adaptive and iterative image processing technique (Prashanth Swamy et al., 2010) which involves Random transform for detect and correct skewness, then adaptively binaries by choosing thresholds then filtered by morphological filters then envelop detection and axis identification done. Finally, pixel esteems are found in the middle value to acquire the computerized ECG signal. Future task is in advancement to enhance the exactness as well as touching base at the proper dpi and the arrangement, additionally in the pipeline is the age of mechanized report and recognizing potential sicknesses dependent on the assessed parameters. This gives an accuracy of 95%. The above overview on the ongoing pattern set to concentrate include from ECG reports utilizing different methods demonstrates the pattern that has been proceeded with an expanded goal in the field of feature extraction immensely.

## **3. Has the Field changed in the way that was not foreseen then?**

On the off chance that we start looking at the strategies and innovations utilized, at that point and now, we can say without much of a stretch familiarize that the field is changed more than it was normal, Earlier the techniques that were utilized to concentrate include from pictures were demonstrating extremely less exact results. There can be different explanations behind not accomplishing appropriate outcomes, that can be the nature of the picture captured if the resolution of the camera isn't high then the nature of the picture

will be ruined for which handling will be very difficult. The processor speed was generally low for high-resolution pictures preparing to pay little respect to any calculation utilized for handling. The algorithms utilized at that point were not effective when the pictures were caught in various angles. The algorithms were not able to perform skew and de-skew process which is one reason for not accomplishing proficient outcomes. These challenges are currently overwhelmed by different algorithms that are utilized to play out a similar errand of removing the element from pictures. Now, the algorithms are proficient to the point that we can accomplish legitimate outcomes inside a moment utilizing a top of the line processor, paying little respect to a picture caught utilizing a high-resolution camera. Current algorithms can be prepared and connected to dependent on vital needs. They can be effectively connected to address the slant edges in the picture that isn't caught accurately. In this way, the present algorithms and the processor speed will cause us to accomplish progressively exact and proficient outcomes. CBIR system is best solution to compare features and identify about the abnormality level of heart attack in human heart as shown in figure 1.

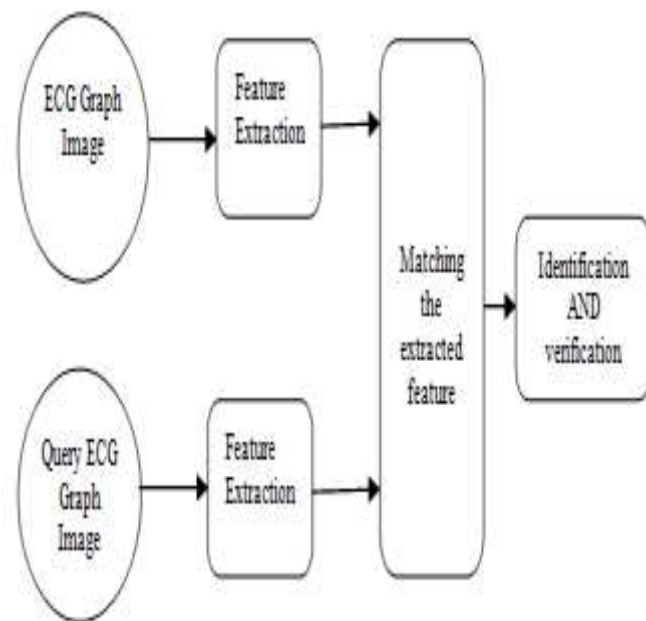


Figure 1. Block diagram for CBIR system for ECG reports.

#### 4. Discussion and analysis on existing work:

Even though some of the process presented in the list of overview has been tested or even improved in some aspects the fact is that none of them works as adequately superimposed feature from any case because they are application-oriented. As a result, an element picture examination is expected to empower the component data extraction framework to be utilized for a picture, including filtered record pictures, genuine scene pictures through a camcorder, caption text images, the analysis shows that most of the process fall into any one of the above mentions process and also there is a limitation in each technique to give a better detection rate with fewer false alarms without any constraints for feature extraction in different types of images. But still, to find the complete the robust and generalized technique for feature segmentation it is different to provide appropriate input to the

system .so an efficient process has to be proposed for automatic wave content extraction from different images which is independent of various characteristics of wave .this paper is the first step towards helping the researchers to build such a system.

### Conclusion

The review of ECG report has been thoroughly diagnosing numerous heart diseases. Various systems and changes have been proposed before recorded as a hard copy for removing feature from ECG. This proposed paper gives a table of various ECG incorporate extraction systems and algorithms proposed recorded as a hard copy as appeared in table 1. The element extraction framework or algorithm made for ECG must be outstandingly

correct and need to ensure the fast extraction of features from the ECG wave. This paper approach also revealed a relative table surveying the introduction of different algorithms that were drawn nearer before for ECG wave feature extraction. The forthcoming work basically centers on working up a algorithm to get exact and fast component extraction. Likewise, extra true data will be utilized for surveying the introduction of an algorithm in the ECG wave feature. Expanding the precision of dissecting the cardiovascular variation from the norm at the most reliable is basic because of patient watching structure. Subsequently, our up and coming work moreover, does some advance in diagnosing the heart variation from the norm with the assistance of the CBIR framework.

### 5. Result Discussion:

TABLE 1

Investigation of Various Techniques Used for Feature Extrication from ECG Graph Report

Sl. No	TITLE,AUTHOR	METHODOLOGY	RESULTS	LIMITATIONS AND RECOMMENDATION
1	A survey on QBIC system for Ecg reports Raghu kumar B S, Naveen B 2019	Comparison of various methods used while extracting feature from ecg reports.	Gives efficient methods to extract feature from ecg reports.	Try to highlights the specific method for feature extraction. Not taken any data set for the feature extraction only given comparison.
2	ECG Signal Acquisition and Analysis for Telemonitoring Emil Plesnik, Olga Malgina, Jurij F. Tasic, Matej Zajc.,2010	Utilizations phase portraits properties with its polygons relating to ECG sign pinnacles, reveal the reason for the recognition work together with QRS complex detection.	It computes the estimations of individual beat as well as all normal beats in the watched interval.	Display visualization of the procured signal is not proper. - False QRS complex were distinguished with sign containing arrhythmias and unusual beats - Few changes of the algorithm can conquer false QRS discovery.



3	Electrocardiogram (ECG) Image processing and Extraction of Numerical Information Dharmendra Gurve, et al 2016	It has sequence of execution that is image upload, image resize, axis dimension calibration, ecg trace extraction, ecg plotting	Ecg curve expressed in terms of numerical coordinates of individual points that is calibration in both X and Y axis reduces the size of the image by preserving all the characteristics of the ECG signal.	It just convert ecg signal to numerical information does not say about stroke, abnormality condition of an heart regarding age gender etc
4	Remote Heart Rate Determination in RGB Data An Investigation using Independent Component Analysis and Adaptive Filtering, Christian Wiede et al.,2016	Independent component analysis and adaptive filtering Fast Fourier Transform and band pass filter	This can achieve a mean error of 4.36BPM which corresponds to CAND of 94.5% and speed of 35FPS.	It only determine heart rate no discrimination regarding heart rate for abnormality detection Accuracy has to be improved because this system more concentrated on elderly care
5	ECG Abnormality Detection Algorithm Soha Ahmed, Ali Hilal-Alnaqbi, Mohamed Al Hemairy and Mahmoud Al Ahmad 2017	Cross correlation algorithm	Detection abnormality Identified the corresponding diseases.	Reduction in processing time is required. Instead of Comparing ECG waveforms it compares between numeric values of converted ecg graph.
6	An approach for ECG Feature extraction using Daubechies 4 Wavelet Muhidin A. Mohamed et al.,2014	Daubechies Wavelet Transform method	Feature extraction is about 90% accurate.	- Amplitude and duration of intervals will take vital part. - Heart beat doesn't count. - Abnormality does not identify.
7	QRS Detection of Ecg - A Statistical Analysis I.S. Siva Rao et	Pan-Tompkins method, multi-wavelet transforms method.	Its feature extraction accuracy is about 92%	-still need to compare large data set based on age and gender.

	al.,2015			-compare more with affected ecg graphical reports
8	A Robust Approach to Wavelet Transform Feature Extraction of ECG Signal Naveen Munjal et al.,2016	Wavelet transforms baseline wander removal algorithm and subsequent segmentation.	Its feature extraction accuracy is about 95%	-it won't identify any specific abnormality. -no comparative study regarding ecg graphical printouts
9	“ECG Printout Features Extraction Using Spatial Oriented Image Processing Techniques” Pocholo James M. Loresco et al.,2017	spatial-oriented image processing methods RMSE and normalized RMSE methods used for testing	Its feature extraction accuracy is about 95.424 %	Even methodology got high accuracy but PR interval feature extraction achieved a less accuracy of 87.196%. - Noisy ECG readings in printouts also constraints brought by meandering benchmark and Fuzzy gauge affect the feature extraction.
10	“A combined approach WNN for ECG feature based disease classification” Harjot Singh, H. P et al., 2017	Wavelet Based method and Artificial Neural Network	Its feature extraction accuracy is about 80%	-it's only applicable to analyse Bradycardia and Tachycardia. -still we are not getting much accuracy need to improve.
11	“Disease Detection By Feature Extraction Of Ecg Signal Based On ANFIS” Anurag Krishna Shukla et al.,2017	Wavelet, Adaptive neuro fuzzy inference system (ANFIS), MSE and RMSE	Its feature extraction accuracy is about 85%	-we can adopt new system that is neuro-fuzzy system to increase accuracy.

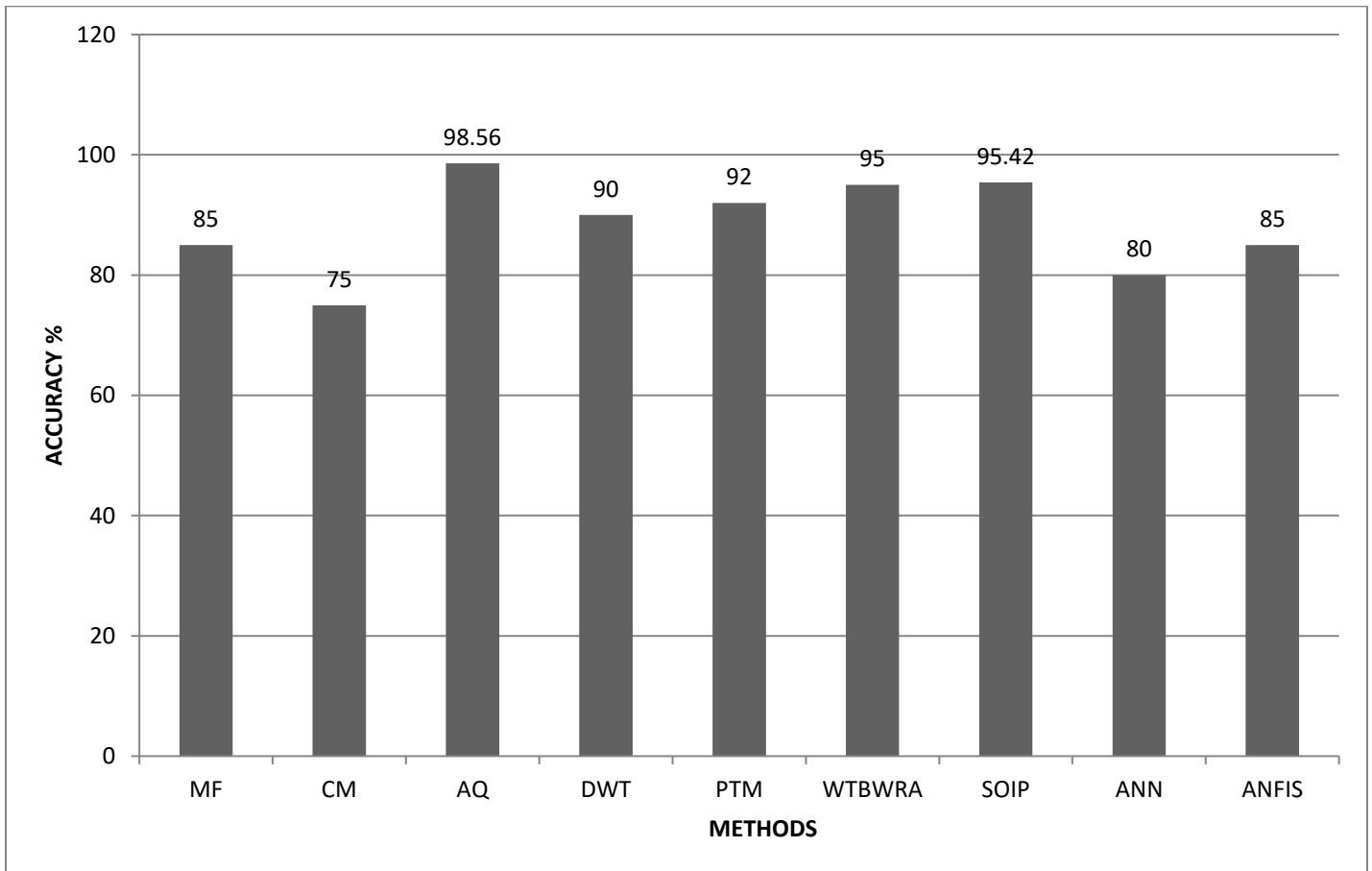


Figure 2 .Feature extraction comparison graphs.

## REFERENCES

- 1) Raghu kumar B S, Naveen B “A survey on QBIC system for Ecg reports” Industrial Engineering Journal Volume 12, Issue 12, December-2019.
- 2) Emil Plesnik, Olga Malgina, Jurij F. Tasic, Matej Zajc “ECG Signal Acquisition and Analysis for Telemonitoring” 15th IEEE Mediterranean Electro technical Conference 2010, Valletta, Malta.
- 3) Dharmendra Gurve, Alok Kumar Srivastava, Kingsuk Mukhopadhyay, N Eswara Prasad , Sachin Shukla, H. Muthurajan1. "Electrocardiogram (ECG) Image processing and Extraction of Numerical Information " International Journal of Engineering Technology Science and Research IJETS, ISSN 2394 – 3386 Volume 3, Issue 7 July 2016.
- 4) Christian Wiede, Julia Richter André Apitzsch, Fajer KhairAldin, Gangolf Hirtz “Remote Heart Rate Determination in RGB Data An Investigation using Independent Component Analysis and Adaptive Filtering” In Proceedings of the 5th International Conference on
- 5) Soha Ahmed, Ali Hilal-Alnaqbi, Mohamed Al Hemaury and Mahmoud Al Ahmad “ECG Abnormality Detection Algorithm” Future Technologies Conference (FTC) 2017 issue 29-30 pp 198-202 November 2017 Vancouver, Canada.
- 6) Muhidin A. Mohamed, Mohamed A. Deriche “An Approach for ECG Feature Extraction using Daubechies 4 (DB4) Wavelet” International Journal of Computer Applications Volume 96– No.12, June 2014.
- 7) I.S. Siva Rao, T. Srinivasa Rao and P.H.S. Tejo Murthy “QRS Detection of Ecg - A Statistical Analysis” ICTACT journal on communication technology, volume 06, issue 01, March 2015.

- 8) Naveen Munjal & Dr Shiv Ratan Singh “A Robust Approach to Wavelet Transform Feature Extraction of ECG Signal” International Journal of Advance Engineering and Research Development, Volume 3, Issue 12, December -2016.
- 9) Pocholo James M. Loresco, Aaron Don Africa, “ECG Print-out Features Extraction Using Spatial-Oriented Image Processing Techniques” Journal of Telecommunication, Electronic and Computer Engineering, Volume 10, Issue 1-5,2017, pp 15-20 ISSN: 2289-8131.
- 10) Harjot Singh, H. P. S. Kang, Poonam Kumari “A combined approach WNN for ECG feature based disease classification” International Journal of Recent Trends in Engineering & Research (IJRTER) Volume 03, Issue 9,September – 2017.
- 11) Anurag Krishna Shukla, Atul Kumar Shrivastava “Disease Detection by Feature Extraction of Ecg Signal Based On ANFIS” International Journal of Advance Engineering and Research Development (IAERD) Volume 4, Issue 9, September-2017.
- 12) Raghukumar B S, Naveen B “Analysis on CBIR system for Ecg reports” International Journal of Engineering and Advanced Technology (IJEAT) volume 9 issue 5, June 2020.
- 13) Naveen B., Dr. K.R. Nataraj, Dr. K.R. Rekha “Design of Simulink Module for a Real Time Image/Video Splitting” International Journal of Computational Engineering Research (IJCER), volume 03, Issue 01, Page No 125 – 131, January-2013.
- 14) Naveen B, Dr. Rekha K. R “Design Parameter Analysis of Simulink and System Generator Module for a Real Time Image Splitting and Enlarging” International Journal of Science and Research – (IJSR), Volume 05, Issue 03, Page No 1699-1702, March-2016.
- 15) Dr Naveen B, Kavya G K, Kruthika S, Ranjitha K, Sahana C “Automated Waste Segregator Using Audrino” International Journal of Advanced Engineering and Research Development (IAERD), Volume 05, Issue 05, Page No 255-261, May-2018.
- 16) Dr Naveen B, Rashmitha B K, Parthasarathi K S, Sandhya B C, Lohith S “IOT Based Petrol Bunk Management for Self- Operation Using RFID and Raspberry Pi” International Journal of Computational Engineering Research (IJCER), Volume 09, Issue 05, Page No 53 – 56, May-2019.
- 17) Dr Naveen B, Kavya N U, Bhavya V S, Gowda Sudharani Gangadhar, Lekhashree M K “Regulation of Diabetes with Robot Manager Using IOT” International journal of Science and Innovative Engineering and Technology (IJSIET), Volume 07, Issue 07, May-2019.
- 18) Dr Naveen B, Kavya N U, Bhavya V S, Gowda Sudharani Gangadhar, Lekhashree M K “Robot Apprentice in Supervision of Diabetes Using Raspberry Pi” International Journal of recent Technology and Engineering (IJRTE), Volume 08, Issue IC, and Page No 147 - 158, May-2019.
- 19) Naveen B, Rashmitha B K, Parthasarathi K S, Sandhya B C, Lohith S “IOT Based Petrol Bunk Management for Self- Operation Using RFID and Raspberry Pi” International Journal of recent Technology and Engineering (IJRTE), Volume 08, Issue IC, Page No 248 - 251, May-2019.
- 20) Fatemeh Molaei Vaneghi, Maysam Oladazimi, F. Shiman, Afshan Kordi, M.J. Safari, F. Ibrahim, “A Comparative Approach to ECG Feature Extraction Methods” 2012 Third International Conference on Intelligent Systems Modeling and Simulation IEEE Transactions on, vol. 12, pp. 978-0-7695-4668-1,2012.
- 21) Pocholo James M. Loresco<sup>1</sup>, May Rose C. Imperial, Ph. D1., King Harold A. Recto<sup>1</sup>, Francisco L. Uyvico Jr. “Detection of R Peaks and RR Intervals in Electrocardiogram Print-outs Using Wavelet Transforms and Hough Transforms” IEEE Transactions on, vol. 18 pp 978-1-5386-5457-6,2018.
- 22) Harjot Singh, H. P. S. Kang, Poonam Kumari “A combined approach WNN for ECG feature based disease classification” International Journal of Recent Trends in Engineering & Research (IJRTER) Volume 03, Issue 9,September – 2017.