,where each l represents a node
Step 4: Define a queue Q
Step 5:Add all nodes into the priority queue
Step 6:Set the priority according to highest probability of bits.
Step 7:Calculate average probability as L(avg)
Step 8:Set bounds as H(s) _ L(avg) < H(s) + 1 , where H(s) is the entropy.
Step 9: Remove first two nodes of higher priority from queue.
Step 10:Create a new node called Nn
Step 11: Add two nodes from step 10 into Nn unmatched probability
Step 12:Repeat steps 10 to 12 till queue is empty
Step 13:Convert tree into ByteArray
Step 14: Write the ByteArray into file.
Step 15:Stop

4. Results and Discussions

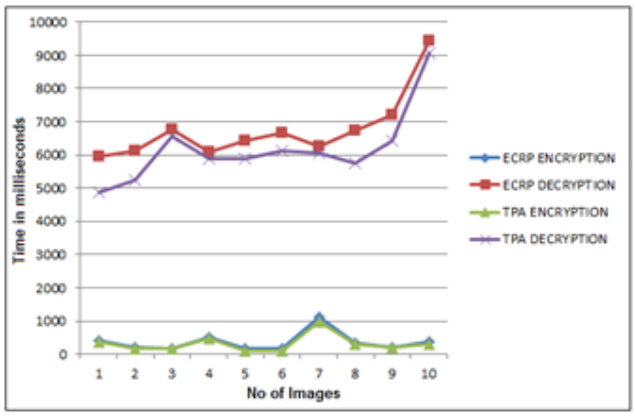
To show the effectiveness of proposed system some experiments are conducted on java based windows machine using netbeans as IDE. To measure the performance of the system we set the bench mark by conducting many tests as follows.

4.1 Encryption Time Performance

Proposed model is tested on many images for its encryption time performance by implementing module of the methods mentioned in the Error Clustering and Random permutation (ECRP) [12] System with our model of Tree pattern Approach (TPA). So as a result of this we get the following results which is plotted in the below graph.
Figure 4: Encryption and Decryption performance Time

The above plot clearly indicates that our approach of TPA clearly over performs in the encryption performance time .

4.2 Compression Time Performance:



Proposed model is tested on many images for its Compression and decompression time performance with ECRP System with our model of Tree pattern Approach (TPA). So as a result of this we get the following results which is plotted in the below graph.

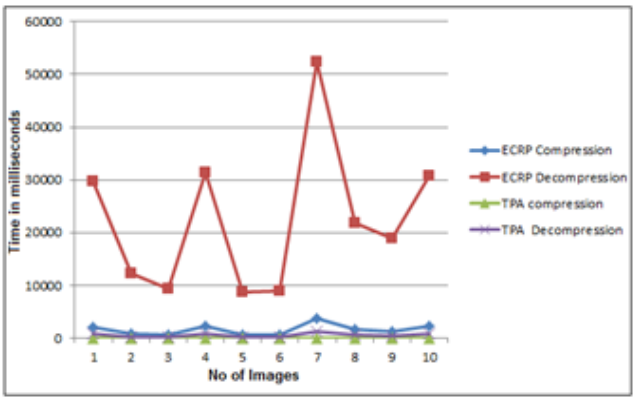


Figure 5: Compression and Decompression time Ratio Comparisons

The above plot clearly indicates that our approach of TPA clearly over performs in the compression and decompression performance time .

5. Conclusion and Future Scope

Our proposed method of Image encryption using image colour model parameter like RGB enhances the complexity in breaking the encrypted data. As our system extract the colour codes of the pixel to mix and merge pixels values to give highly complex structure of encrypted image. Proposed system is using compressed tree format for calculating byte probability of the pixels to compress the image in more advance format. Our System is lossless where the recovery of the original image is up to 100%. The proposed system can be enhance to reach more accuracy in compression so that compression ratio can be increase to the $1/10^{th}$ of the original image. This can be good contribution over the image compression techniques.

References

[1] "A Survey On Different Image Encryption and Decryption Techniques" Rinki Pakshwar, Vijay Kumar Trivedi, Vineet Richhariya . Rinki Pakshwar et al, / (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 4 (1) , 2013, 113 – 116
[2] "Image Encryption Using Different Techniques: A Review" Komal D Patel, Sonal Belani International Journal of Emerging Technology and Advanced Engineering
[3] "Secure Image Encryption Algorithms: A Review" Lini Abraham, Neenu Daniel . INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 2, ISSUE 4, APRIL 2013
[4] "A STUDY OF VARIOUS IMAGE COMPRESSION TECHNIQUES" Sonal, Dinesh Kumar
[5] "Lossless image compression techniques" BC vemuri, S.sahni.
[6] "Lossless Image Compression Technique Using Combination Methods" A. Alarabeyyat1, S. Al-Hashemi1, T. Khdour1, M. Hjouj Btoush1, S. Bani-Ahmad1, R. Al-Hashemi2 Journal of Software Engineering and Applications, 2012, 5, 752-763

[7] "Simple Fast and Adaptive Lossless Image Compression Algorithm" Roman Starosolski∗ December 20, 2006 Software—Practice and Experience, 2007, 37(1):65-91, DOI: 10.1002/spe.746
[8] "Enhanced System for image's compression and encryption by addition of biometric characteristics" A. Loussert, A. Alfalou, R. El Sawda, A. Alkholidi ISEN-BREST Laboratory L@BISEN 20 rue cuirasse Bretagne C.S. 42807, 2922
[9] "Designing an Efficient Image Encryption-Then-Compression System with Haar and Daubechies Wavelet" Harmanpreet Kaur Aujla, Rajesh Sharma, Harmanpreet Kaur Aujla et al, / (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 5 (6) , 2014, 7784-7788
[10] "**Image Compression and Encryption: An Overview** " Abdul Razzaque International Journal of Engineering Research & Technology (IJERT) Vol. 1 Issue 5, July - 2012 ISSN: 2278-0181
[11] " A Novel Image Encryption Supported by Compression Using Multilevel Wavelet Transform" Ch. Samson1 *(IJACSA) International Journal of Advanced Computer Science and Applications, Vol. 3, No. 9, 2012*
[12] Jiantao Zhou, Xianming Liu, Oscar C. Au, Yuan Yan Tang ," Designing an Efficient Image Encryption-Then-Compression System via Prediction Error Clustering and Random Permutation " ,IEEE TRANSACTIONS ON INFORMATION FORENSICS AND SECURITY, VOL. 9, NO. 1, JANUARY 2014 39