

ABSTRACT

Digital image processing in the medical field is often used to improve the accuracy of information to carry out a disease, including in the form of rontgen. The more patient data that is stored, causes the required memory to be large enough and requires high operating costs. One solution to this problem is the image compression process to produce rontgen that are smaller and easier to transmit.

In this study, a comparison of compression techniques and reconstruction of rontgen using CS and interpolation techniques was carried out. The image compression process uses a compression ratio of 1: 4, 2: 4, 3: 4 which includes random matrix values and produces a smaller image size. The CS OMP reconstruction phase requires the IDCT transformation and the OMP algorithm. On the other hand, at the reconstruction stage the linear interpolation results of the compressed image are reconstructed using a linear interpolation algorithm. After the two methods have been reconstructed successfully, the results comparison stage is carried out using measurement parameters RMSE, PSNR, and computation time.

Based on the results of the calculation of the average RMSE method of CS OMP is 0.6499, the RMSE result for spline interpolation is 0.57 and the linear interpolation is 0.51. The average PSNR result for the CS OMP method is 59.84, the PSNR result for spline interpolation is 61.06 and linear interpolation is 62.5. spline and linear are 50 to 200 times faster than the CS method. Based on the test results, the performance of the linear interpolation method is better than the spline interpolation method and CS OMP in rontgen.

Keywords: image, rontgen image, compressive sensing, OMP, linear interpolation, interpolation spline, RMSE, PSNR, computation time