ABSTRACT

In internet networks, there is data traffic called internet traffic. In a real network, loss of internet traffic can occur, because of that it is very important to accurately reconstruct so that data integrity is maintained. In this study an investigation of the capabilities of the compressive sensing (CS) method and the interpolation method for the reconstruction of missing traffic is by simulating.

The simulation is done by compressing Abilene's network internet traffic which has a matrix dimension of 12×12. The compression process uses a sensing matrix with randomly generated elements and the compression ratio used is 1: 4, 1: 2, 3: 4, the compression process will be generate internet traffic with smaller matrix dimensions. The process of reconstructing internet traffic using the CS method is performed using the orthogonal matching pursuit algorithm while the reconstruction using the interpolation method is carried out using a linear and spline algorithm. At the stage of evaluating the performance of the CS method and interpolation, measurements were made between the original data and the reconstruction data using the root mean square error (RMSE) method and peak signal to noise ratio (PSNR) and computational time.

The RMSE results from CS OMP are 4156.51, The RMSE results from spline interpolation are 3696.42 and the RMSE results from linear interpolation are 2982.70. PSNR results from CS OMP are 37.86 dB, PSNR results from spline interpolation are 39.11 dB and PSNR results from linear interpolation were 42.76 dB. The PSNR results have passed 30 dB which means they are similar to the original data. Whereas the computing time of the linear and spline interpolation method is 7 times and 9 times faster than the CS method. Based on the results of the performance appraisal, the interpolation method with linear algorithm has better performance than the CS OMP and spline interpolation method in the reconstruction of internet traffic.

Keyword*: Internet traffic, Compressive sensing, Interpolasi linear, spline interpolation RMSE, PSNR*