ABSTRACT

Currently, several musicians usually record in digital format, which facilitates the creation of music and its distribution across various media as a means of self-expression. This also applies to players of the Kalimba musical instrument. The recording process is done repeatedly and requires significant storage capacity. Thus, compression techniques are necessary during data acquisition to efficiently utilize storage space. Compressive Sensing (CS) is a data acquisition method that captures partial data or signal samples, reducing the amount of data stored.

In this research, Kalimba audio signal data will be compressed using the Compressive Sensing method. Compressive Sensing (CS) itself consists of three stages. First, there's the sparsity transformation using the Discrete Wavelet Transform (DWT) algorithm. Next, samples are taken using a measurement matrix. Afterward, the audio signal's results will be reconstructed using the L1 algorithm.

Performance parameters used in this study are the Root Mean Square Error (RMSE) and the Mean Opinion Score (MOS). The goal of this research is to assess the accuracy level of Kalimba audio signals, both during the compression process with Compressive Sensing and during reconstruction using L1. The performance testing results based on the RMSE performance parameter with a compression ratio of 0.1 yielded values of 0.39078, 0.54777, and 0.60199, while for a compression ratio of 0.8, the values were 0.18341, 0.40781, and 0.16682. The MOS values for a compression ratio of 0.1 were 1.6, 1.5, and 1, whereas for a compression ratio of 0.8, the MOS values were 4.1, 3.7, and 4.2. From these two testing results, it can be concluded that reconstructed audio signals with compression ratios approaching 1 tend to have better outcomes.

Keyword: *Compressive Sensing, L1, Kalimba's audio signal, RMSE, MOS.*