ABSTRACT

Compressive sensing (CS) is a novel sampling paradigm that samples signals in a much more efficient way than the established Nyquist Sampling Theorem. Compressive Sensing has recently gained a lot of attention due to its exploitation of signal sparsity. Sparsity, an inherent characteristic of many natural signals, enables the signal to be stored in few samples and subsequently be recovered accurately, courtesy of compressive sensing. This project gives a brief background on the origins of this idea, reviews the basic mathematical foundation of the theory and compares the different reconstruction schemes. In this project a signal is generated, sampled using the compressed sensing method and the original signal is reconstructed. Three different reconstruction schemes namely Greedy Iterative, Convex Relaxation, and Iterative Threshold are used. The accuracy and the time taken for the Greedy Iterative, Convex Relaxation, and Iterative Threshold reconstruction schemes are calculated and compared. It was found that the Greedy Iterative scheme took the least time for signal reconstruction and had the least error rate amongst the three schemes implemented.