

ABSTRACT

Sparse Representation Classification or commonly referred as SRC is one of sparse representation application. The use of the SRC method as a classification system has been proven by Wright et al. in 2009 which was able to overcome illumination, occlusion and pose variations in face recognition problem. In the SRC method there is a reconstruction step to find the \mathbf{x} matrix subject to $\mathbf{y} = \mathbf{Ax}$. There are very few study related to signal reconstruction algorithm in SRC method. Therefore this thesis compares reconstruction algorithm to determine its effect to SRC accuracy performance. These reconstruction algorithm are: OMP (Orthogonal Matching Pursuit) which use l_0 -minimization method, both LASSO (Least Absolute Shrinkage and Selection Operator) and CVX Programming which use l_1 -minimization method. Based on the system testing using AT&T dataset, we obtain that LASSO and CVX algorithm have the same recognition rate of 94.5% and more stable in each dimensional reduction, although the computation time of LASSO is 1.2 times faster than CVX. Meanwhile, the OMP algorithm has 99% accuracy when the reduction factor is 128 times and it decreases drastically in other dimensions. OMP also has the fastest computation time which is 0.2 times faster than LASSO and 1.7 times faster than CVX. However in system testing using high occlusion dataset, the OMP recognition rate decrease 40.5% than the original system testing. Meanwhile, LASSO and CVX algorithm have better performance, which is only reduced by about 10% of the original system testing.

Keywords: *Sparse Representation Classification (SRC), Compressive Sensing (CS), and reconstruction technique.*