

Abstract

We consider the problem precision matrix estimation with temporal dependent observations. For the problem of precision matrix estimation in high-dimensional graph, the first step is usually the precision matrix structure determination, which is equivalent to problem of non-zero entries identification and selection of the precision matrix. There is a considerable amount of literature that studied the method of precision matrix estimation with independent observations. However, in certain cases, the samples are dependent, for instance, there is a temporal dependence among the observations. The estimation may be inaccurate if we ignore the temporal dependence and apply approaches for independent observations directly. To deal with the temporal dependence, we propose a new method, called the blocking-grouping method. The idea of this method is to divide observations into several groups such that observations in the same group are independent. Then apply existing approaches for each group and pool the estimates obtained from all the groups together in a proper way. In this project, the feature selection method we will use is the joint regression SLasso (JR-SLasso) method, developed in Luo and Chen (2014). Simulation studies are conducted to compare the blocking-grouping method with direct estimation by ignoring the temporal dependence.