

A Parameter Study Of Subspace Identification Using Recursive Formulation

Shieh-Kung HUANG, Jun-Da CHEN, Chin-Hsiung LOH

Autonomous damage assessment of structure under external loadings, such as earthquake excitations, is an important issue in structural safety evaluation. In this regard, real-time or online system identification techniques can be used to track the modal parameters, identify the state of the structure, and provide the warning message about damage. Generally, the recursive algorithm is used to achieve real-time or online system identification; in this study, the recursive subspace identification (RSI) algorithm is applied. Subsequently, the user-defined parameters in RSI are carefully examined, which include the size of the data Hankel matrix, model order to extract the physical modes, and forgetting factor to track the time-varying system. For verifying the proposed user-defined parameters in RSI, different datasets are used in this study. Finally, a brief summary and general suggestion on choosing suitable user-defined parameters in RSI are given and this paper ended with a conclusion.