

## **Identifying Influential Variables in Complex System: Network Topology Versus Principal Component Analysis**

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### **ABSTRACT**

High dimensional covariance structure can be considered as a complex system that relates each variable to the others in terms of variability. In complex system, identifying influential variables is a very important part of reliability analysis, which has been a key issue in analysing the structural organization of a system. To analyse such complex system, network topology and principal component analysis are constructed to simplify the system. Network topology can be used to simplify the information about the system and centrality measure will be used to interpret the network. In the other hand, the principal component analysis can be used to eliminate the variables that contribute little extra information. An example will be discussed to illustrate the advantage and disadvantage of network topology and principal component analysis and a recommendation will be presented.

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