Fault detection by using dynamic model developed from Modified Independent Component Analysis (MICA)

지유미, 박병언, 이인범†
포항공과대학교
(iblee@postech.ac.kr†)

For the fault detection of chemical process, statistical process monitoring methods are applied to data. However, typical methods like PCA and ICA doesn't consider meaning of time dependency well. So dynamic models such as Dynamic Principal Components Analysis (DPCA) and Dynamic Independent Component Analysis (DICA) are needed. In this research, the novel method is developed to consider time dependency. The new dynamic model is developed from MICA. Whereas DICA doesn't have criteria for the dimension reduction, the new model has a criteria. Also it modifies the problem of MICA algorithm to have global optimum values for the ICs. To prove the new model, it applied to typical chemical data such as Wastewater Treatment Plant (WWTP) data. By using the developed model, it's better to detect faulty cases than PCA, DPCA and MICA.