

Automatic analysis framework via process variable isolation using sampling and graphical methods

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Favors in integrating process to achieve high energy efficiency have led process designs to be complicated with thousands of process parameters and variables. Remarkable advances in processing resources and numerical methods have facilitated meeting the demands of finding optimal process designs, however, the optimization results are unmanageable to properly understand due to the increased process variables. Although recently developed artificial intelligent methods have facilitated designing processes with a minimum of human intervention, understanding the resultant design remains work of researchers. Here, a framework for understanding complex processes by capturing the relations of process variables is suggested. Graphical lasso was adopted to isolate the variables into independent subgroups and the inferences between the subgroups were analyzed to comprehend the impact of each process variable. The suggested framework was implemented to comprehend the optimization result designing a methanol production process.