Decoupling Multivariable Processes using Partial Least Squares for Decentralized Control

Abstract

Multivariable control systems suffer very much from unwanted interactions among control loops. Change in setpoint of one variable may cause other variables to deviate from their respective steady states because of couplings between unpaired variables. Due to unreliability problems, conventional decouplers are not appropriate for higher order processes. This paper proposes Partial Least Squares (PLS), multivariate statistical process control technique (MVSPC), based decoupling strategy to attain satisfactory performance and consistent product quality in spite of disturbances. The proposed scheme was applied on conventional and heat integrated distillation processes. The results have shown the reliability and robustness of Partial Least Squares based decouplers over conventional decouplers.

References

Decoupling Multivariable Processes using Partial Least Squares for Decentralized Control

- S. J. Zhao, J. Zhang, Y. M. Xu, Z. H. Xiong, "Nonlinear projection to latent

Index Terms

Computer Science  Control Systems

Keywords

PLS  multivariable interactions  decoupling