Abstract

PCA based temperature controller was used to control Ethanol concentration produced in Yeast fermentation process. The controller was designed at a specific operating point and its disturbance rejection performances were studied. Substrate inlet temperature proved to be the most significant disturbance input from the analysis of open loop responses. Q-statistic (SPE) of process measurements confirmed that in the face of disturbances and noise the process could be held to the specific operating condition using the controller designed in subspace.

References

- M. Galluzzo, B. Cosenza, A. Matharu, "Control of a nonlinear continuous
- J. E. Jackson, \textquotedbl;A User\textquoterights Guide to Principal Components\textquotedbl;, Wiley, New York, (2003).
- J. E. Jackso, G. Mudholkar, \textquotedbl;Control procedures for residuals associated with principal component analysis\textquotedbl;, Technometrics, Vol. 21, (1979), pp: 341-349.
- L. B. Palma, F. V. Coito, P. S. Gil, R. Neves-Silva, \textquotedbl;Process Control based on PCA Models\textquotedbl;, 15th IEEE Int. Conf. on Emerging Technologies and Factory Automation, Univ. of the Basque Country, Bilbao, Spain, (2010).
- L. B. Palma, F. V. Coito, P. S. Gil, R. Neves-Silva, \textquotedbl;Design of Adaptive PCA Controllers for SISO Systems\textquotedbl;, 18th IFAC World Congress Milano, Italy, (2011)
- S. L. Shah, R. Miller, H. Takada, K. Morinaga, T. Satou, \textquotedbl;Modelling and control

**Index Terms**

Computer Science Control Systems

**Keywords**

Principal Component Analysis bioreactor subspace