

عنوان مقاله:

Design of Centralized Fractional order PI Controller for Two Interacting Conical Frustum Tank Level Process

محل انتشار:

دوماهنامه مکانیک سیالات کاربردی, دوره 10, شماره 0 (سال: 1396)

تعداد صفحات اصل مقاله: 10

نویسندگان:

S. K. Lakshmanaprabu - *B S Abdur Rahman Crescent University*

A. V. Nasir - *National Institute of technology Jamshedpur*

U. Sabura Banu - *B S Abdur Rahman Crescent University, Chennai, Tamilnadu*

خلاصه مقاله:

The mathematical model for two interacting conical frustum tank level (TICFTL) process is proposed. The control of TICFTL process is difficult due to the nonlinearity, interaction effect between input flow and output level of tanks. Hence, the nonlinear process is linearised around proper operating points. Then, the decentralized PI, centralized PI, centralized FOPI controllers are designed and then the control parameters are tuned using genetic algorithm. The closed loop controller performances are simulated and compared in terms of settling time, rise time and integral error criteria. It is found that centralized PI controller has better servo and regulatory response than the decentralized PI, centralized FOPI controller. The liquid inflow rates are optimally manipulated by the centralized PI controller to track the set point variation and to reject the disturbance effectively than centralized FOPI, decentralized PI controller.

کلمات کلیدی:

Two interacting conical frustum tank level process, Flow control, Level control, Centralized PI, FOPI, Decentralized PI controller

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1378561>

