

Design of Fractional-Order PI Controller with Smith Predictor for Processes with Time Delay

Hasan Mudassir, Truong Nguyen Luan Vu, 이문용*
영남대학교
(mynlee@ynu.ac.kr*)

This paper proposes a new methodology to design the fractional-order proportional-integral controller embedded in a Smith predictor (SP-FOPI). On the basis of fractional calculus and Bode's ideal transfer function, the analytical tuning rules can be systematically obtained for enhancing the output performance of the control system in terms of both the set-point tracking and disturbance rejection problems. The simulation results are demonstrated that the proposed SP-FOPI controllers provide the superior responses in comparison with the other well-known methods, when all controllers are tuned to have the same degree of robustness according to the measure of the maximum sensitivity function. This research was supported by-the KOSEF research grant 2009.