Optimization based control strategy for second order unstable processes with time delay

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Abstract

In this paper, stabilization and control of linear time-invariant systems with two unstable poles and time delay are looked at. It is well known that time delays make it harder to analyze stability and come up with good control strategies. Because of this, suggest a simple control strategy based on "dynamic optimization" to stabilize this type of system. In this work, dynamic optimization (DO) to figure out the PID controller parameters for a process that is unstable in second order plus time delay (SOPTD). In particular, the process model is used to figure out the controller parameters so that integral performance criteria and controller variations are kept to a minimum (such as ISE, IAE and TV). The controller responses looked at both the set-point following the load disturbance rejection. Robustness studies have been carried out for uncertainties in the process parameters. Lastly, some examples are given to demonstrate the controller performance and robustness.

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