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A Unique Exact Approach to Handle a Time-Delayed State-Space System: The Extraction of Juice Process

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Abstract : This paper discusses the application of Time Delay Control (TDC) compensation technique in the juice extraction process in a sugar mill. The objective is to improve the control performance of the process and increase extraction efficiency. The paper presents the mathematical model of the juice extraction process and the design of the TDC compensation controller. Simulation results show that the TDC compensation technique can effectively suppress the time delay effect in the process and improve control performance. The extraction efficiency is also significantly increased with the application of the TDC compensation technique. The proposed approach provides a practical solution for improving the juice extraction process in sugar mills using MATLAB Processes.

Keywords : time delay control (TDC), exact and unique state space model, delay compensation, Smith predictor.
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