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Design and Implementation of Decentralized Pi Controller for Pilot Plant Binary Distillation Column

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Abstract: The article presentsa decentralized Proportional Integral (PI) controller for a pilot plant binary distillation column and discusses, the basic theory of the decentralized control technique. The Relative Gain Array (RGA) approach is used for input output pairing. The PI controller is designed based on process parameters such as time constant and time delay of the process transfer function matrix. The algorithm is compared with cross- control technique, and the performance is evaluated with Integral Square Error (ISE) and Integral Absolute Error (IAE)criteria. The simulation technique has been adopted to study the main effect and the interaction effect of the plant model for the identified distillation column. Moreover, servo and regulatory response are evaluated. Further, the simulated results are validated in real- time environment for theidentified Two Input Two Output (TITO) distillation column model.
Keywords: Pilot Plant, Decentralized PI Controller, Relative Gain Array, Integral Square Error, Integral Absolute Error.

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