

CHAPTER 58

TECHNOLOGY  
INSTRUMENTATION AND CONTROL  
ENGINEERING

Doctoral Theses

622. VINEET KUMAR

**Some Investigations on Intelligent Controllers for Processes.**

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*Abstract*

Deals with a formula-based fuzzy P + fuzzy I + fuzzy D (FP + FI + FD) controller based upon the parallel architecture of conventional PID controller and a formula-based fuzzy I - fuzzy P - fuzzy D (FI - FP - FD) controller based upon the modified architecture of conventional parallel PID controller i.e. parallel integral minus proportional minus derivative (I-P-D) controller. These formula-based fuzzy controller freeze the linear structure of conventional parallel PID and I-P-D controller respectively, with analytical formulas. The performance of proposed formula-based fuzzy controllers is evaluated experimentally on highly nonlinear liquid-low process with hysteresis characteristic due to pneumatic control valve.

*Contents*

1. Introduction.
2. Literature review and present work.
3. Formula based fuzzy P + fuzzy I + fuzzy D controller.
4. Formula based fuzzy I - fuzzy P - fuzzy D controller.
5. Performance evaluation and adaptive analysis of controllers.
6. Modeling and control of liquid-flow process.
7. Conclusions and suggestions for further work.