CHAPTER 58

TECHNOLOGY
INSTRUMENTATION AND CONTROL
ENGINEERING

Doctoral Theses

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**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.