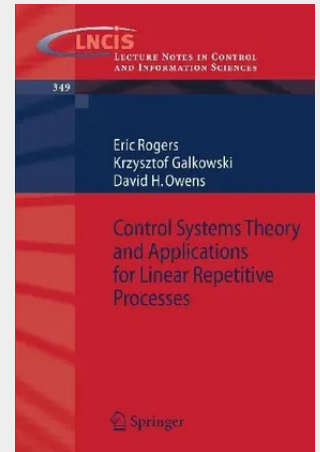


Control Systems Theory and Applications for Linear Repetitive Processes

After motivating examples, this monograph gives substantial new results on the analysis and control of linear repetitive processes. These include further applications of the abstract model based stability theory which, in particular, shows the critical importance to the dynamics developed of the structure of the initial conditions at the start of each new pass, the development of stability tests and performance bounds in terms of so-called 1D and 2D Lyapunov equations. It presents the development of a major bank of results on the structure and design of control laws, including the case when there is uncertainty in the process model description, together with numerically reliable computational algorithms. Finally, the application of some of these results in the area of iterative learning control is treated --- including experimental results from a chain conveyor system and a gantry robot system.

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