



# Robust Control for Uncertain Networked Control Systems with Random Delays [

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Monografía

"Robust Control for Uncertain Networked Control Systems with Random Delays" addresses the problem of analysis and design of networked control systems when the communication delays are varying in a random fashion. The random nature of the time delays is typical for commercially used networks, such as a DeviceNet (which is a controller area network) and Ethernet network. The main technique used in this book is based on the Lyapunov-Razumikhin method, which results in delay-dependent controllers. The existence of such controllers and fault estimators are given in terms of the solvability of bilinear matrix inequalities. Iterative algorithms are proposed to change this non-convex problem into quasi-convex optimization problems, which can be solved effectively by available mathematical tools. Finally, to demonstrate the effectiveness and advantages of the proposed design method in the book, numerical examples are given in each designed control system

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**Contenido:** Introduction -- Modeling of Networked Control Systems -- PART I: Linear Uncertain Networked Control Systems -- State Feedback Control of Uncertain Networked Control Systems -- Dynamic Output Feedback Control for Uncertain Networked Control Systems -- Robust Disturbance Attenuation for Uncertain Networked Control Systems -- Robust Filter Design for Uncertain Networked Control Systems -- Robust Fault Estimator

Design for Uncertain Networked Control Systems -- PART II: Nonlinear Uncertain Networked Control Systems -- Takagi-Sugeno Fuzzy Control System -- State Feedback Control for Uncertain Nonlinear Networked Control Systems -- Dynamic Output Feedback Control for Uncertain Nonlinear Networked Control Systems -- Robust Disturbance Attenuation for Uncertain Nonlinear Networked Control Systems -- Robust Fuzzy Filter Design for Uncertain Nonlinear Networked Control Systems -- Fault Estimation for Uncertain Nonlinear Networked Control Systems -- Conclusions -- Appendix: Mathematical and Background Knowledge

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