



Stochastic Control Synthesis of Systems with Structured Uncertainty

By Sharon L. Padula

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 34 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. This paper presents a study on the design of robust controllers by using random variables to model structured uncertainty for both SISO and MIMO feedback systems. Once the parameter uncertainty is prescribed with probability density functions, its effects are propagated through the analysis leading to stochastic metrics for the systems output. Control designs that aim for satisfactory performances while guaranteeing robust closed loop stability are attained by solving constrained non-linear optimization problems in the frequency domain. This approach permits not only to quantify the probability of having unstable and unfavorable responses for a particular control design but also to search for controls while favoring the values of the parameters with higher chance of occurrence. In this manner, robust optimality is achieved while the characteristic conservatism of conventional robust control methods is eliminated. Examples that admit closed form expressions for the probabilistic metrics of the output are used to elucidate the nature of the problem at hand and validate the proposed formulations. This item ships from La Vergne, TN. Paperback.



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