

Computer-aided nonlinear control system design: using describing function models

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Abstrak

[Computer-aided nonlinear control system design provides such an approach based on the use of describing functions. The text deals with a large class of nonlinear systems without restrictions on the system order, the number of inputs and/or outputs or the number, type or arrangement of nonlinear terms. The strongly software-oriented methods detailed facilitate fulfillment of tight performance requirements and help the designer to think in purely nonlinear terms, avoiding the expedient of linearization which can impose substantial and unrealistic model limitations and drive up the cost of the final product.

Design procedures are presented in a step-by-step algorithmic format each step being a functional unit with outputs that drive the other steps. This procedure may be easily implemented on a digital computer with example problems from mechatronic and aerospace design being used to demonstrate the techniques discussed. The author's commercial MATLAB®-based environment, available separately from insert URL here, can be used to create simulations showing the results of using the computer-aided control system design ideas characterized in the text.;Computer-aided nonlinear control system design provides such an approach based on the use of describing functions. The text deals with a large class of nonlinear systems without restrictions on the system order, the number of inputs and/or outputs or the number, type or arrangement of nonlinear terms. The strongly software-oriented methods detailed facilitate fulfillment of tight performance requirements and help the designer to think in purely nonlinear terms, avoiding the expedient of linearization which can impose substantial and unrealistic model limitations and drive up the cost of the final product.

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