Multivariable Control Without State Variables^{*}

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Abstract:

Multivariable control systems are traditionally taught via state variable models of the plant to which quadratic optimization is applied. This results in state feedback, implemented via observers leading to high order controllers. In this talk we describe some new results on direct transfer function based design for multivariable systems. In this way we avoid a) contructing state variable realizations 2) computing state feedback controls which are unrealizable and 3) ending up with high order controllers. At the same time the design of an n-input n-output (MIMO) system is decomposed into an equivalent set of n single input single out (SISO) systems, thus allowing all the design capabilities of low order SISO designs to be attained for MIMO systems far beyond those attainable by quadratic optimization alone. Illustrative examples will be described..

Shankar Bhattacharyya is the Robert M. Kennedy Professor of Electrical Engineering at Texas A & M University and is currently a Pesquisador Visitante Especial at the Departmento de Engenharia Elétrica e de Computação, USP São Carlos. His field of interest is Control Systems and he has authored/coauthored 8 books and nearly 300 papers in this field. He is an IEEE Fellow, an IFAC Fellow and a Foreign Member of the Academia Brasileira de Ciencias and the Academia Nacional de Engenharia, Brasil.





Apoio: Programa Pesquisador Visitante Especial

^{*}The talk will be given in portuguese