

PARAMETERIZED UNCERTAINTY MODEL USING A GENETIC ALGORITHM WITH APPLICATION TO AN ELECTRO- HYDRAULIC VALVE CONTROL SYSTEM

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ABSTRACT

This work proposes a new method of determining a parameterization of an uncertainty model using a genetic algorithm. A genetic algorithm is used in a unique way to solve the non-convex parameterization problem in this work. Then followed an algorithm of dimension search to determine dimension properties using Cayley-Menger Determinant. The methods presented here are demonstrated on an electrohydraulic valve control system problem. This demonstration includes parameterizing an uncertainty class determined from test data for 30 replications of an electrohydraulic flow control valve. The parameterization of the uncertainty is used to analyze the robust stability of a control system for a class of valves.