A comparison of PDD, LQG, H2 and H-infinity-controllers for a laboratory process

A COMPARISON OF PDD , LQG , H_2 and H_∞ -CONTROLLERS FOR A LABORATORY PROCESS.

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Abstract

The design and application of four different types of controllers for a laboratory process will be presented.
Two of the controllers have been designed using the classical control theory, the PDD- and the LQG-controller [1]. The other two controllers have been designed using more recently developed techniques, the H_2- and H_∞-optimal controller [2];[3],[4].
The properties and performance of the controllers will be compared and discussed for the theoretical model as well as for the application on the process.

References:

1.M.H.Driessen : Realization of a mechanical experimental process for education .
M.Sc.-Report , Faculty of Electrical Engineering, Eindhoven University of Technology, the Netherlands (in dutch).

2.A.J.J.van den Boom : H_∞-control, an exploratory study .
EUT-Report 88-E-211 .Faculty of Electrical Engineering Eindhoven University of Technology, the Netherlands.

3.J.C.Doyle et al. : Lecture notes on advances in multivariable control ONR/Honeywell Workshop 8-10 oct.1984
Minneapolis Minnesota
Office of Naval Research Washington DC 1984

4.K.Glover and D.McFarlane : Robust stabilization of normalized coprime factors: An explicit solution.
In : Proc. 7th 1988 American Control Conf., Atlanta, Ga., 15-17 June 1988.
Green Valley, Ariz.: American Automatic Control Council, 1988. p. 842-847