OPTIMIZATION OF DIGITAL CONTROL WITH DELAY BY PERIODIC VARIATION OF THE GAIN PARAMETERS

Abstract:
Position control is a frequent mechanical controlling problem in robotics. To achieve a clear picture about the behavior of the control, digital effects, like sampling, should also be included in the mechanical model. Analytical investigation of simple models with 1 degree of freedom (DOF) play a central role in understanding technical phenomena and forming the common sense in design work.

The effect of periodic gain variation on the stability and robustness of position controlled machines is investigated in the presence of time delays larger than the sampling time itself. Caused by the delay and the sampling effect, the governing equation is a delay-differential equation (DDE). The "act and wait" technique is used: the gains are constant for the first sampling period (act), then they are zero for a certain number of samplings (wait), then they are constant again, etc. The effect of time delay and the periodic gains are investigated via stability charts and optimal controls are given.

Date:  Friday, November 19, 2004

Time:  2:00 PM
Coffee will be served in ECSN 3.106 at 1:30 p.m.

Room: GR 3.302

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