

DC-Motors Speed Asynchronization in Nonlinear Process by Selective State Feedback & Integral Control

Ashab Mirza*, Capt Dr. Sarfraz Hussain

Pakistan Navy Engineering College, National University of Sciences & Technology (NUST), PNS
Jauhar, Habib Rehmatullah Road, Karachi-75350. PAKISTAN

Abstract

In textile industry many processes require speed synchronization (or asynchronization) of more than one motors involved in the process. Rolling of cloth should be synchronized with the speed of weaving spindle to avoid damage and similarly motors-speed synchronization is vital in a conveyor-belt driven by multiple motors. Abrupt load (or power-supply) variations may cause hunting or oscillatory behavior in dc machines. This behavior can be detrimental to the process. The digitally controlled dc-machines (or motors) can have much aggravated phenomena owing to poor sampling period selection. This paper gives a simple yet efficient solution to the problem.

Key Words

Synchronization, dc-Motors, Digital Control, Process Control, Sampled data MIMO system.

Introduction

Although improved materials and manufacturing methods continue to refine electric machines, the fundamental issues relating to electromechanical energy conversion have been established for well over a century. In such a well established field, it may come as a surprise that today there is more research and development activity than ever before.

Many textile industrial applications involve synchronized speed motors. Wrapping of cloth should be synchronized with the speed of weaving spindle to avoid damage and similarly in some cases the speed of long-conveyor, driven by multiple motors, is needed to be constant. Sudden load application or supply variation may cause hunting or oscillatory behavior in dc machines, and this behavior can be detrimental to the whole process. Digitally controlled dc-machines (or motors) can have much aggravated phenomena due to poor selection of the sampling period.



* Mailing Address: ST-22/C Gulshan-e-Iqbal Block-6, Karachi-75300, PAKISTAN