URN etd-0407109-183718-1460
Author Chia-Ming Chang
Author's Email Address No Public.
Statistics This thesis had been viewed 42 times. Download 31 times.
Department
Year 2004
Semester 2
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Design and Implementation of a Fully Digital Hybrid Hydraulic and Electric Controller
Date of Defense 0000-00-00
Page Count 146
Keyword
Injection modeling machine
hybrid hydraulic and electric control system
auto-tuning
load inertia estimation
adaptive fuzzy control
in-parallel interlaced sampling

Abstract
The design and implementation of a DSP-based fully digital hybrid hydraulic and electric controller is proposed in the thesis. The controller is applied to the injection modeling machines in which ball screws are driven by permanent-magnet synchronous motors or hydraulic cylinders driven by servo valves.

To improve the system performance, three topics are studied in the hybrid control system, auto-tuning design and load inertia estimation, adaptive fuzzy control at transfer point of velocity and pressure control, and in-parallel interlaced sampling. According to the estimation of the motor load, appropriately initial values of proportional and integral gains are set. During the switching between velocity and pressure control, the adaptive fuzzy control is employed to resolve the phenomenon of pressure drop.

The architecture of in-parallel interlaced sampling may have larger speed-loop bandwidth and higher resolution. Finally, the experimental results demonstrate the effectiveness of proposed algorithms implemental in the DSP-based controller.
Advisory Committee Ming-Shyan Wang - advisor

Files etd-0407109-183718-1460-001.pdf

indicate access worldwide
Date of Submission 2005-07-25