兩軸伺服機構精密運動控制

A high-order cross-coupled controller and a software-type velocity observer are porposed to improve the motion accuracy of two-axis servomechanisms. The cross-coupled controller is based on the contour-error model and its gains are designed by solving a set of six nonlinear algebraic equations. The velocity observer utilizes the driving current and position output of the system to form a closed-loop for velocity observation. The simulation and experimental results show that the high-order cross-coupled controller can reduce the contour error in high speed motions. The proposed control algonthms have potential usages for precision motion controls of multi-axis servomechanisms in manufacturing applications.