Thesis Title	Transient Response Improvement of DC Motor Speed Control with Multiple Loops.
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ABSTRACT

This thesis presents development of permanent magnet DC-motor speed control system. The typical speed control system consists of two loop controllers, i.e. current and speed. This thesis presents three-loop speed control system, which consists of voltage controller, current controller and speed controller. The PI controller of each loop is designed by Modulus and Symmetrical optimum method. By adding voltage control loop into the control system, the transient response to the step input and step load in comparing with the two-loop speed control system has improved. According to experimental results, the settling time of the system response to the step input and step load are improved by 28.8% and 31% respectively. Moreover, the overshoot of system with step load is reduced by 32.5%. If the speed controller of three-loop system is replaced by PID type controller, the settling time of system response to the step input and step load are improved by 64.3% and 65.5% respectively. Therefore, the overshoot of system response to step load is reduced by 69.3%.