

Wijin Suteeratanapirom 2010: Position Feedforward and Friction Feedforward Compensation on CNC Milling Machines. Master of Engineering (Information and Communication Technology for Embedded Systems), Major Field: Information and Communication Technology for Embedded Systems, Department of Electrical Engineering.

Thesis Advisor: Assistant Professor Peerayot Sanposh, D.Sc. 78 pages.

In CNC milling machine position control, accuracy is importance because most of work pieces are used for prototype work such as mold using with plastic injection machine. CNC milling machines have many mechanical components such as motors, bearings, ball screws, linear guideways, and etc. It's sure that the friction effect is a main problem that affect to position control.

In this research, the friction effect problem is solved using both friction feedforward compensation and position feedforward controller. To use friction feedforward compensation technique, friction model and its all parameters must be known. The selected friction model is Armstrong's model. Simulation using MATLAB with Simulink is illustrated. For implementation, NI-Data Acquisition Card: PCI-6251, and MATLAB with Simulink is used. Moreover, a prototype control board using a high-performance Freescale DSP, MC56F8345, is used to control the motor position by 2-phase pulse counting. INEX experimental board, JX2148, which use ARM microcontroller, LPC2148, is used to measure position of motor. The program on DSP and ARM microcontroller is developed by using C language.

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