The Study of Control of Spline EDM

E-mail: 9314961@ mail.dyu.edu.tw

ABSTRACT

After the interpolator generates the commands, the buffered command control algorithm (BCCA stores the commands into the buffer. The interrupt surface routine (ISR) pulls the data from the buffer to be the reference of the position controller according to the results of the gap controller. The algorithm can reduce the sampling time and that the sampling rate and fast response can be improved in the trajectory control systems. The purpose of the study is that the BCCA selects the appropriate commands stored by a spline interpolator, in order to prevent the delay and the constraint of the block process during the start of the block. The machining method of a parametric curve is applied by the BCCA. The trajectory error of the contour control is analyzed. The erosion speed is also compared with the one generated by a sequential line segments.

Keywords : CNC, EDM, command control, filter design, buffer storage, computer architecture.

Table of Contents

REFERENCES

[1] Rajurkar, K. P. and Wang, W. M., " A New Model Reference Adaptive Control of EDM," - Annals of the CIRP Vol.38/1, pp.183-186, 1989.

[2] Wang, W. M. and Rajurkar, K. P., " Modeling and Adaptive Control of EDM Systems," - Journal of Manufacturing Systems Vol. 11, No. 5, pp.334-345, 1992.

[3]   ," --- ," , pp.33-42, 82   3 .

[4]   ," ," , pp.909-915, 82   7 .

[5]   ," The VSS Controller Design for Edm'ing Motion Control Systems," , pp.95-104   83   11

[6]   (   ), " VLSI ," ,83   6 .

[7]   ," ," 88 pp.1329-1336,
        : NSC 87-2212-E-212-003

[8] Chang, Yih-Fang, Yang, Shin-Seng and Nien, Yung-Feng, " The Optimal Control on CNC - EDM," The 5th International Automation Conference in Taiwan, 1998.

[9] Chang, Yih-Fang, " The Monitoring and Control of DischargeEfficiency on EDM," The 6th International Automation Conference in Taiwan, NSC 88-2212-E-212-010, pp.361-36 -6, 2000.

[10]   ,   ," ," ,   26   8   pp.400-407, 2000

[11] Koren, Y, "Computer Control of Manufacturing Systems," McGraw-Hill,Inc.,1983.

[12] Koren, Y. , Lo, C. C. and Shpitalni, M.," CNC Interpolators: algorithms and analy -sis," ASME Winter annual meeting, PED-Vol. 64, pp.83-92, 1993.

[13] Shpitalni, M., Koren, Y. and Lo, C. C., " Real-time curve interpolators," Comput er-Aided Design, Vol.26, pp. 832-838, 1994.

[14] Yeh, S. S. and Hsu, P. L.," The speed-controlled interpolator for machining param etric curves," Computer-Aided Design, Vol. 31, pp. 349-357, 1999.

[15] Lin, R. S. ," Real-time surface interpolator for 3-D parametric surface machining -on 3-axis machine tools," Int. J. Mach. Tools Manufact., Vol.40, pp.1513-1526, 2 000.

[16] Yeh, S. S. and Hsu, P. L., " Adaptive-feedrate interpolation for parametric curve -s with a confined chord error," Computer-aided Design, Vol.34, pp.229-237, 2002.

[16] Chen, M. Y., Tsai, M. C. and Kuo, J. C.," Real-time NURBS command generators for -CNC servo controllers," Int. J. Mach.Tools Manufact., Vol.42 ,pp.801-813, 2002.

[18] Chang, Yih-Fang, " Buffered DDA Command Generation in a CNC", accepted by Contro -l Engineering Practice, 2002.