



LOOK-AHEAD LINEAR JERK FILTER FOR A COMPUTERIZED NUMERICAL CONTROL

YIH-FANG CHANG*, TRUONG-GIANG NGUYEN**

** Professor*

***Ph.D. student*

Department of Mechanical and Automation Engineering

Da-Yeh University

Taiwan, ROC

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

ABSTRACT—In high-speed precision machining systems, reference trajectory generation with smooth kinetic profiles plays a key role in the computerized numerical control (CNC). In this paper, look-ahead linear jerk filter algorithm is proposed to ensure smooth and accurate motion with a linear jerk change. The look-ahead algorithm detected the step-changing points of the speed curve. At each step-changing point, the speed curve was modified by proposed method in order to approach given maximum acceleration/deceleration and jerk for the purpose of saving machining time. The number of filter registers depended on time was also generated base on fluctuation of speed curve. The commands filtered by the look-ahead linear jerk filter stabilize the beginning, the end and the step-changing speed points of the motion of the machine table. A multiple-step-changing speed curve of a CNC machine and a speed curve of a measurement system were constructed in order to verify the feasibility and precision of the proposed algorithm.