

Sakkasam Sujintanarat 2012: A Motion NC-file Modification for 5-Axis CNC Machine with Jerk Constraint. Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Mr. Chana Raksiri, D.Eng. 93 pages.

Five-axis CNC machine is a machine that can produce parts with complex shape, accuracy and precision. The ideal production is to minimize production time and obtain specified specifications. Therefore, trajectory planning is an important part in production in order to meet the design requirements. Because of the minimize time required in production, it needs for high value of velocity and acceleration. However, the higher value of Jerk (rate of change of acceleration) can cause trajectory tracking error which results in a poor surface or misshape of the workpiece. Furthermore, it can damage the workpiece and cutting tools. Hence, jerk is a key factor in tool-path generation. Accordingly, the jerk control in good condition can help cutting more efficient. However, due to the coordinate that the workpiece coordinate system and the machine tool axis system is non-linear relationship, the speed, acceleration and jerk between the workpiece coordinate system and the machine tool axis system is not equal. When controlling jerk on the workpiece sometimes jerk on the machine still has higher than a certain level. Therefore, controlling jerk should control machine tool axis system by controlling jerk on the assumption that acceleration before and after control have similar values. This is for machine time is closest to the original. When controlling jerk under the criteria set, it is found that the workpiece coordinate has changed from the original. So, the standard error of measurement of the workpiece coordinates is specified. If the deviation exceeds the specified coordinates, any further restrictions are considered.

---

Student's signature

---

Thesis Advisor's signature