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Mr. Speice

ISM I

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Computer-Aided Manufacturing

Research Assessment 6

Date: 11/1

Subject: CAM Path generation

Works Cited:

Cerit, E. and I. Lazoglu. "A CAM-Based Path Generation Method for Rapid Prototyping Applications." *International Journal of Advanced Manufacturing Technology*, vol. 56, no. 1-4, Sept. 2011, pp. 319-327. EBSCOhost, doi:10.1007/s00170-011-3176-y.

Assessment:

Throughout this article the author explains the current methods for creating CAM, computer-aided manufacturing, paths and compares them to new methods which are currently in development. The author also explains how accurate each process is, while also explaining the benefits and drawbacks of each process. In the article the author also explains how the design process is different for models produced with rapid prototyping and those produced with CNC machines. Models produced for CNC milling typically needed to be designed as a cavity in a solid block while models for RP were created as normal models would be created. The author also explains the actual conversion process from a model to the machine instructions while also providing examples of manufactured parts.

This article on CAM-based path generation helped to further connect and solidify the corroboration between rapid prototyping and 3D printing with the side of CNC milling. The article explains how the process of splitting a model up into layers is nearly identical for both types of manufacturing in that they are both layered manufacturing techniques but differ in that CNC milling is subtractive while rapid prototyping and 3D printing is additive. This means that CNC machines cut away material while 3D printing deposits material in order to create a part. The author of this article also explains how often paths created for CNC milling operations can also be used for RP operations. The CNC milling mentioned in this article was also able to connect back to my interview with Dr. Kovacevic a few weeks earlier who also discussed the field of 3D printing, rapid prototyping, and CNC milling. The article I read helped to not only reinforce the information I had learned during the interview about the manufacturing process, but also give an insight into what happens “behind the scenes” on the computer side of this process. While this article did give me insight on the computer-aided manufacturing process, it did not focus very much on CNC machining as I hoped. Many of the pictures shown in the article pertained more to the RP side of mechanical engineering instead of pertaining to both CNC milling and RP. After reading this article, I finally understood some of the processes for creating curves when manufacturing a model while also learning some of the math involved in this process. However, this article also presented several questions such as I now wanted to know the conversion process for using the CLS file processed for a CNC machine to a CLS file for a RP machine as well as if there were any other alternatives to the proprietary slicing software as mentioned in the article.

For future research, I plan to find more articles or ask more questions in interviews associated with the field of CNC machining to learn more about the aspects and processes which go into the milling process. I also want to try and learn more about how products are designed and more about the design process and each stage from a product's inception to its finished stage. In addition to learning more about the design process, I also want to learn more about how developments such as CNC machining and rapid prototyping are affecting the mechanical industry and how much more beneficial it can be to use these manufacturing methods. As I continue to conduct more research and meet with other professionals, I will be sure to look for answers to the questions I have regarding the manufacturing process and possibly gain new ones which I will have to answer with further research.

Annotated Article:

<http://scrible.com/s/m8VA6>