

Shaping tomorrow's

With machine automation and integration becoming increasingly complex, the task of simulating that accurately in a virtual world will fall on the shoulders of each new generation of engineers

American scholar, organisational consultant and author Warren Bennis is quoted as saying: "The factory of the future will have only two employees: a man and a dog. The man will be there to feed the dog. The dog will be there to keep the man from touching the equipment."

Bennis, widely regarded as a pioneer of the contemporary field of leadership studies, has yet to see that vision become a reality. However, as machine automation and integration become more complex, so does the demand to simulate it accurately in a virtual world. And this demand will continue to increase with every new generation of engineers.

CGTech's latest version of its VERICUT CNC machine simulation and optimisation software, VERICUT 7.1, features significant enhancements to reduce the time required for students and education providers to easily develop, analyse, inspect and document the CNC programming and

machining process. For the simulation of CNC machine tools, CGTech's VERICUT software provides a number of benefits to students and manufacturers alike. The software simulates all types of CNC machine tools, including those from leading manufacturers such as Mazak, Makino, Matsuura, Hermle, DMG, Mori Seiki, Makino and Chiron.

The software can be operated standalone, so that manually created programs can be simulated, allowing the student to experiment in a safe virtual environment. Alternatively, it can be seamlessly integrated with leading CAD/CAM systems, such as Dassault Systemes Catia, Siemens NX, Creo (Pro/E), MasterCAM, EdgeCAM, Delcam PowerMill and Open Mind Hypermill.

"Full VERICUT licences are available to educational establishments and training providers for a fraction of the commercial price," says CGTech managing director John Reed. "We offer a year-long licence which can be renewed for subsequent years at the same low price. The licence allows the use of VERICUT on multiple machines on a college network. The software is not restricted in performance or functionality, but must not be used for any profit-generating activities."

Total virtual environment

As the software can fully simulate the machine tool, tooling and workholding, as well as the raw material, it provides the student and teacher with a complete virtual environment. And VERICUT comes with extensive training materials and training exercises, while lecturers are trained free of charge on scheduled courses.

Benefits of using VERICUT include increased quality by verifying dimensional accuracy and optimising tool paths for



better finishes on surfaces and edges. Students learn to make components right the first time to enhanced specifications.

In educational establishments, conserving resources is another importance benefit provided by VERICUT. The software reduces machine tool and cutting tool wear, so cutting tools can be used longer before needing to be reground or replaced.

VERICUT also improves safety and training, as students can be trained to check programs for any NC system, without using machine tool time or risking a dangerous, costly collision. The software also improves documentation by enabling students and education providers to preview all machining operations.

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Experimenting – without fear

By reducing or eliminating the cost of machine tool crashes, rework, scrapped parts, and damaged tooling, fixtures, and clamps, VERICUT can save money in any machine tool equipped environment, including school and college workshops. It allows students to experiment and gain experience, without fear of any costly physical damage. This builds confidence, as test part programs can be evaluated on a computer, so they run right the first time on the machine and the students don't need to keep one hand on the 'emergency stop' button.



engineers

Developed and supported by CGTech, VERICUT is the world's leading CNC simulation and verification software. Protecting CNC machine tools against disastrous crashes, it allows users to create a full simulation environment to optimise any metal cutting process.



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analyse, inspect and document the CNC programming and machining process.

One new feature that is helping this is a standalone Reviewer. This collaboration tool allows 3D simulations to be shared with anyone in the educational environment, without the need for a VERICUT licence. The Reviewer can play forward and backward, while removing and replacing material. Error messages and NC program text are highlighted when a collision on the stock or fixture is selected.

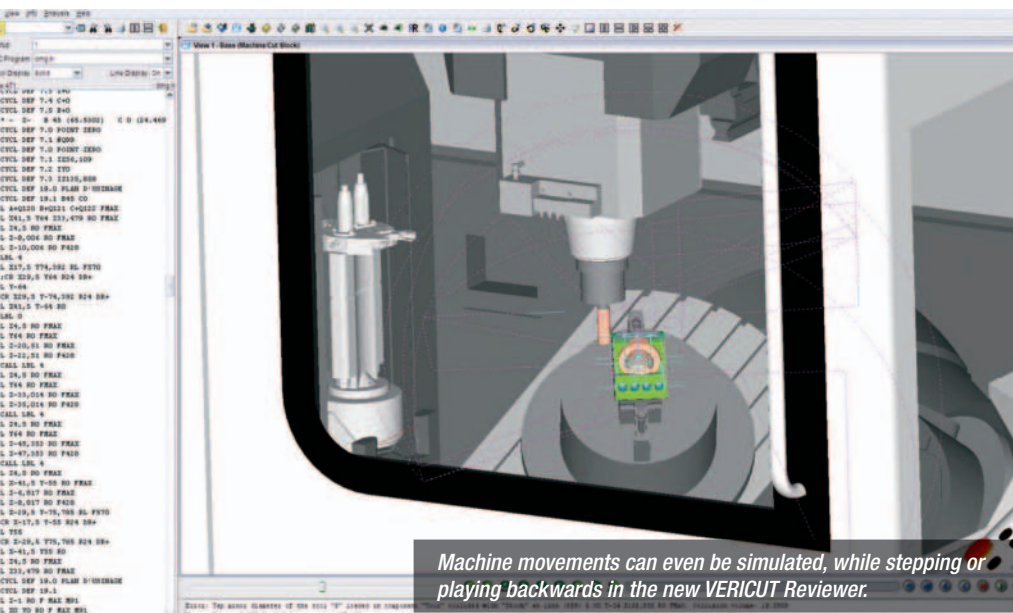
A tool path line display is optional. The user can rotate, pan and zoom, as with normal VERICUT, and the cut stock can be measured, using all the standard X-caliper tools. The Reviewer file can be saved at any point in a VERICUT session.

Cutting conditions are shown in the status display and available when stepping through the program, using NC Program Review. The feature shows detailed information about the cutter's engagement with material, including: axial depth, radial width, volume removal rate, chip thickness, maximum surface speed and contact area. Of course, this data can be exported and used for materials science and mathematics units.

High value

With the VERICUT report enhancements, users can preview and customise report templates to include features such as pictures and videos, and links to files and websites. These reports have become increasingly valuable for VERICUT users to share CNC machining process information across study groups.

John Reed concludes: "From our extensive library of machine tool models, we provide a set of machine tool configurations from a variety of popular manufacturers. We make the assumption that there are no 'real' machine tools in the colleges. So, unlike the manufacturing environment, it is not about proving out programs for a real machine – rather, it is a way to give students an opportunity to 'use' all different types of CNC machine tool."



Machine movements can even be simulated, while stepping or playing backwards in the new VERICUT Reviewer.