Milling and drilling in cyberspace

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Trainees use a computer to operate this virtual handling system for biological compounds. They can transport Petri dishes with bacteria cultures over a conveyor, control grippers and take samples. Credit: Fraunhofer IFF

Machinists, NC programmers or mechatronics engineers -- trainees in engineering jobs often have to master complex equipment. In the future, trainees will practice and learn milling, turning, drilling and programming routines on a virtual model.

A trainee carefully clamps a workpiece in a lathe. He must program the machine correctly before he can machine the part. This is a tricky task and the trainee will have to solve a similar problem for his final exam. Therefore, he is learning to handle such equipment at a vocational school. However, rather than standing in front of a real machine, he sits in front of a computer. The control panels and the lathe behind it appear on a monitor. A computer guides the trainee step by step.

The Fraunhofer Institute for Factory Operation and Automation IFF, the Technologie- und Berufsbildungszentrum TBZ Magdeburg and the Schweisstechnische Lehr- und Versuchsanstalt SLV Halle have launched the ViReKon project, which is being coordinated by the Rationalisierungs- und Innovationszentrums RKW Sachsen-Anhalt. They intend to train engineers with the aid of virtual reality VR. Researchers at the Fraunhofer IFF are developing virtual models of different machines for this. "The TBZ presently uses a simple model of a real sorting system for hands-on training. It only allows trainees to practice a few tasks though," says André Winge, Group Manager at the Fraunhofer IFF. "However, budding mechatronics engineers, programmers or machinists can be taught quite specifically on virtual equipment and train a whole number of different tasks." To this end, the experts from the Fraunhofer IFF are developing special e-learning methods together with the vocational trainers. "A trainee ought to be able to operate more than just the machine and the control unit," says Winge. "An integrated didactic training concept explains the tasks to students. The system monitors their achievement and provides them feedback on the correctness of their performance of the individual tasks."

Another advantage: Vocational schools do not have to purchase any expensive equipment. Turning, drilling and milling are possible in cyberspace - on large as well as small machines. "We are able to design a virtual model of any system," says Winge. For instance, the researchers also created a VR model of a handling system for biological compounds. A conveyor transports Petri dishes with bacteria cultures. A gripper picks them up and transfers them to the sampling station where a pipetting unit takes a sample and processes it further. Trainees follow the procedure in the virtual system on a monitor, while the control unit they use is real. Specialists or maintenance engineers in companies could also be trained on such a VR system in the future.

Source: Fraunhofer-Gesellschaft (news : web)