

INFORMATION TECHNOLOGY IN EDUCATION

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ABSTRACT

The article presents the creation of application programs developed at Department of Measurement and Automation, at Faculty of Mechanical Engineering University of Žilina. Developed programs are used for support of branch subjects education for more study branches at Faculty. Support of education is direction to area of hand programming and automation programming. Exploitation of information technology is in form of programs for machining simulation and education multimedia programs. The education is running on the specialized laboratory of automation and CNC machines.

Keywords: education, programming, information technology, simulation, multimedia.

1. INTRODUCTION

This time is characteristic of quickly changing of marketing and technological background. Are requested new and advanced demands on every employee in all organisations and firms. In competition will be score only that firm, which get advantage of continue developed employees on every levels. Is off course, that expended time and costs of education must be return corresponding form in results.

In this time in area of education and communication is preferred solution application of multimedia. Multimedia makes possible using for presentation of information more devices which makes possible using several senses together. This make possible more quickly understand required problematic and are opened space for solution of specific problems. Continual progress of computer systems and requirement of circulation information brings continually new knowledge. Applications for creating computer systems are developed, too. Machine industry is important area for insertion multimedia to education. There is important visual information and structural processes which define course of development perception production background.

2. MULTIMEDIAL EDUCATION PROGRAM FOR COMPUTER AIDED MANUFACTURING BY CAD/CAM SYSTEM ALPHACAM

Presented multimedia program is used for aided education of automated programming in CAM system ALPHACAM. The students of four classes are informing about this problem within the frame of subject Programming of production machines and robots. Following requests and experiences with creation of multimedia program is one part of application is adjusted for auto running from CD. This part is determined for users without access to internet. The second part is web application in form web pages, which are possible, install on internet server.

The application was made by general available programs for aided of development multimedia application. Tools for organization and modification components of application were used, too. These programs offer enough resources for creation of interaction with application, creation of messages. Often programs contains libraries of predefined tools for speed up of development own application.

For built of multimedia programs for CD and web were used next software tools:

- programming packet AutoPlay Media Studio,
- software for creation internet pages Microsoft Office FrontPage 2003,
- program for capture of display Turbo-Demo.

All actives components in application have added different reciprocals relations, activities and control. Movement of buttons in pull down menu, after click of mouse, was made by means of simple script language. How property of submenu was used them visibility. Text showed in viewer of education program and web application is made in HTML language. Revision test is programmed in PHP language. Questions and answers are saved in database system MySQL. Is it possible editing and adding them.

Application is used for acquaintance with structure and control of CAM system ALPHACAM. It makes possible get knowledge theoretical and practical about system ALPHACAM. It needed for education on Department of machining and automation. User interface offer menu, main screen and control of web browser (fig.1.). Information are presented to students in form describe of system, examples in text and video form. Problem of automated programming of CNC machines is worked for technological operation of turning and milling.

TEST č.1

Tu si môžete vyskúšať ako ste si zapamätali informácie obsiahnuté v tomto multimediálnom výukovom programe.

Otázka č. 1
 Co je AlphaCAM?
 CAD/CAM systém pre programovanie NC strojov
 CAD/CAM systém pre ľahovo zložité súčasti
 CAM systém určený pre kontrolárov

Otázka č. 2
 Ako sú úrovne modulov v AlphaCAMe?
 Standard, Professional
 Basic, Standard alebo Advanced
 Advanced 2, TSD, Advanced 3ony, Advanced 5 os

Otázka č. 3
 Ako pozostáva zložka zdieľa LICOMDAT?
 NC programy a parametrické makrá
 Podprogramy a parametrické makrá
 Podprocesory a knižnice nástrojov

Príklad	Nomenklatura	Objem práce	Matematická zložitosť
A	Výškovce	90 - 100	1
B	Veľkosť dolnej	80 - 89,9	1,5
C	Dokce	70 - 79,9	2
D	Uspokojenie	60 - 69,9	2,5
E	Dostatočne	50 - 59,9	3
FX	Nedostatočne	0 - 49,9	4

Niekolko súvisiacich odkazov

- <http://www.utc.sk> - stránky Zemskej univerzity
- <http://www.licom.com> - firma Licom a produkty
- <http://it-learn.fri.utc.sk/learn/2003/zbornik/02velidova.pdf> - využitie multimédií pri vyučbe bakalárskej školy na STU v Bratislave
- <http://www.vifuniv.cz> - e-learningový portál moravskosliezského regiónu
- <http://vsportal.osu.cz> - e-learningový portál
- <http://elearning.cesnet.cz/pace/teorie.html?z=0> - stránky teórie e-learningu
- <http://www.elfa.cz/efemove/didaktickoformy/elfa.htm> - slovník e-learningu
- <http://hockicko.utc.sk/semestralky/index.html> - výber skúšky semestrálnych prác z fyziky
- <http://www.jakzasteh.cz/> - technické učebnice a zdieľaním internetových stránok
- <http://www.php-g-ghp.icinet.cz>

Figure 1. Structure of visualization information in multimedia programme

The knowledge of students is possible check by means of tests with questions from CAD/CAM area. The application contains several types of tests. Its differ them fastidiousness, size and flexibility. Important advantage of tests for teacher is flexibility. Result of test evaluation is displayed in summary tab. This tab is possible print. This is then foundation for teacher about redemption of test by student.

Test was made in programming language PHP and data-base system MySQL where are save questions and answers. Links to web pages are offered to students. This links are from automation programming and CAD/CAM system area. Therefore application contain web browser, too. It makes possible work with internet. Offer information by means of internet has large advantage in possibility continue actualisation. Educations texts for courses on internet in compare with classic courses is possible more easy continuous innovate, to update new animations, dictionaries and different interesting things. Application is well running on conventional PC with operating system Windows. For correct run of application is necessary web browser Internet Explorer 5 or higher and player of video Flash Player. Created multimedia application can be applied for education of student on our department. For training of employers which used system ALPHACAM in practise, too. Practical application of program was positively evaluated in firm LICOM from Prague, too. This firm distributed system ALPHACAM and our department is long time collaborated with it.

3. SIMULATIONS PROGRAMMS FOR SCHOOL MACHINES EMCO-MAIER

For education of programming NC machines are used turning machines of Austrian firm EMCO MAIER on Department of machining and automation. Programmable lathe EMCO MAIER Compact 5 CNC and mill EMCO F1-CNC are equipped with control system for work in two and three axes.

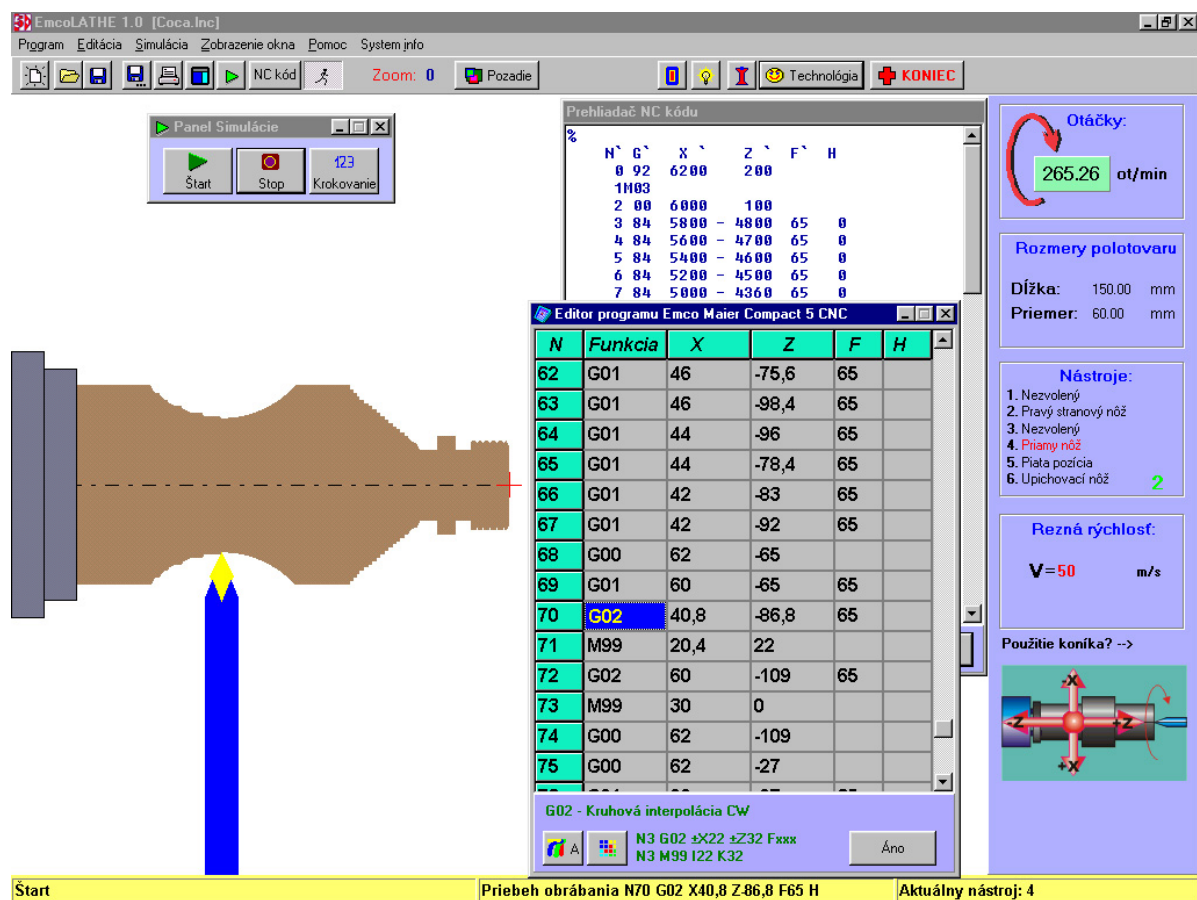


Figure 2 Display of programme for lathe EMCO –5CNC with image of simulation cutting process, dialog window of editor NC programme and file with listing of NC programme.

The both machines have similar principle of programming and record of NC programme. The control systems contain all important Make and Go function. The offer possibilities of using fixed cycles with consideration on type of machines. Styles of programming these machines so even is possible think it atypical machines. They are assigned for education using and are different from NC machines of 3 and 4 generation used in practice.

The programs were made in system DELPHI with aid of programming language Pascal. They bring some upgrade, users comfort and compatibility with MS Windows environment. During of development were important innovation and installation new elements. The goal was limpidity and simplicity at work with programme. Education of creating NC programme and visual simulation of cutting process for school lathe EMCO 5 CNC and mill EMCO F1 is main task of them.

Main display of programs is possible organize to some parts. There are displayed information or making operation. Biggest part of display is reserved for simulation of cutting process. Next part is information panel which displayed information about all important data (dimensions, cutting parameters, axle system ...). The third part is pull-down menu and tools panel with all commands of both CNC machines. Main pull-down menu of programs contain items for creation, editing (fig.2) and simulation of NC programme by means of dialog windows. In both events is for creation of NC programme possible used help.

These programs make possible definition of new or editing of made work-piece, too. Is it possible choosing the tool from database for NC machine. By means of simulation of cutting process is possible prove the NC program and then parts make on machine. The programs contain of speed-up simulation function, which markedly reduce time needed to prove NC programme. There is step function of simulation which make possible prove every line of NC program step by step therefore faster uncover mistake in NC program. During of simulation is in lower sector of display actual line of just making function. This provides wider information about running simulation and values. The programs makes possible NC programs exports by means of serial port RS 232 to control system of machines or import from control system back to computer.

4. CONCLUSION

Is possible say that society is better when having more learned people live inside her. Every society needs quality education for people. Therefore school are constraint educate bigger numbers of students. However double of students brings with him even double of costs on them education. And just here is shoving potential of e-learning for which this formula is false. Just this reality is beginning to understand several schools and universities on over the world. Just in these schools is future and just these organisation are working more effectively and are developing quickly. E-learning gradually updates classic form of study. Described multimedia programs were made with intention touch this effort. The programs are used to acquaint oneself with control of system ALPHACAM and programming CNC machines. Result of study is possible check by means of test. Important advance of test for teacher is him flexibility. Great advance of offers information by means of internet is possibilities of continue actualisation. Education texts for internet courses in comparison classic are possible more easy improve, update about different animation, dictionary and next interest or re-build. Credo is arouse in students desire for continue develop, get new knowledge and be excellent in own discipline. This effort is in sense known citation from Aristoteles:

„Student is not goblet, which is necessary fill up, but torch, which is necessary light up. “

5. REFERENCES

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- [2] Kočiško, M.: Creation Of Construct Documentation For The Area Of Joints Disassembling. In: Proceedings of 5th International Meeting Of The Carpathian Region Specialist In The Field Of Gears, North University of Baia Mare, Romania, 2004, str. 35 – 38, ISSN-1224-3264.

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