Technical University of Košice
Slovakia
Faculty of Electrical Engineering and Informatics

Annual Report

1999

Department of Electrical Drives and Mechatronics

Technical University of Košice, Slovakia

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Katedra elektrických pohonov a mechatroniky

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Contents

Foreword

In this report presented are activities of the Department of Electrical Drives and Mechatronics (Katedra elektrických pohonov a mechatroniky) for the year 1999. It contains information about organisation of the department, information about under- and postgraduate courses, overview of students' works, research activities and projects undertaken in collaboration with the industry, list of publications, information about the staff members and further information about scientific and other events organised by the Department in the year 1999.

In the past year the following most important events marked the departmental life:

- a new international project within Leonardo da Vinci programme (ELINA) has been launched,
- We organised and held the traditional High-Tech Herľany Engineering Symposium,
- we organised the 13th International Conference on Electrical Drives and Power Electronics, EDPE '99 in hotel Academia, Stará Lesná, the High Tatras,

There were also several events pertinent to the department staff:

- Doc. Ing. Pavol Záskalický, CSc. has joined "the club of 50",
- Ing. Le Quang Duc closed his activity with our department and has returned home to Vietnam to collaborate with us in the position of research fellow,
- five Ph.D. students have joined the department,

The descriptions in this brochure are necessarily brief and further information can be obtained by contacting the department or the person concerned.

Further details can also be found on homepage on Internet: **http://www.tuke.sk/fei-kep**

Doc. Ing. Jozef Fedor, CSc.
Head of the Department

1. Introduction

The Faculty of Electrical Engineering and Informatics (FEI) of the Technical University of Košice was founded in 1969. Since its establishment 6,963 students graduated at the faculty (in 1999 there were 466 brand new graduates). Currently we have some 2040 undergraduate and 64 postgraduate students. The faculty staff consists of 259 members, among them 14 professors proper, 52 associate professors, 105 assistant professors, 11 assistants and 23 persons of research crew.

The Department of Electrical Drives and Mechatronics - Katedra elektrických pohonov a mechatroniky (KEPM) is one of the 11 educational units of the FEI (10 departments and 1 specialised laboratory).

The Department is responsible for education in subjects relating to the electrical engineering. The main goal is to prepare undergraduate students for their career both in industry and research. The Department offers both types of undergraduate curricula (M.Sc. and B.Sc.) as well as the Ph.D. postgraduate course.

Since the faculty establishment in 1969, altogether 1,490 students graduated at the Department.

The students are studying at the Department from the third year of their study: in the current 1999/2000 academic year there are totally 61 students studying with the department (11 students in the third year, 17 in the fourth and 33 students in the fifth year).

The Department offers also postgraduate education. Since its establishment, 35 postgraduate students have defended satisfactorily their dissertations and were awarded by the CSc. degree (equivalent to a Ph.D. degree). There are 9 supervisors within the Department specialised in different fields of electrical engineering. The current number of full- and part-time Ph.D. students is 20.

The Department is deeply involved in teaching of the electrical engineering subjects for students studying at other faculties of the Technical University too. The number of students from Faculty of Mechanical Engineering (SjF) total to 430, from the Faculty of Mining Engineering (FBERG) - 275 and from the Faculty of Metallurgical Engineering (HF) - 220.

The Department very closely co-operates with industrial enterprises in design and reconstructing of production lines, various electrical equipment, electrical drives and l systems of control.

In field of international co-operation the department managed the first international project (TEMPUS) at the Faculty, in early 90-ies. In framework of the project besides of the staff members, also many students and postgraduate were mobilised and took a part of their study at partners' institutions.

Since 1973 the Department organises biannual scientific conferences on Electrical Drives and Power Electronics which in 90-ies attained high reputation for holding international conferences with English as the conference language. In 1996, the Electrical Drives and Power Electronics Symposium Users (so called Industry Day) was established as a pre-conference action and it provides as a meeting of the specialists from industry for exchange of experiences and advances in the similar topics (as a pre-conference action).

2. Structure of the Department

The current number of staff members is 3; among them 22 full academic staff members, 3 researchers and 4 supporting and technical staff. The department is divided into 3 divisions, according to the field of specialisation:

- Division of Electrical Drives,
- Division of Industrial Electronics and Automation,
- Division of Electrical Machines and Apparatus.

An overview of the department divisions is given in the table below:

Head of Department:	*Jozef Fedor*
Deputy Head of Department:	*Viliam Fedák*

Divisions:

Electrical Drives	Industrial Electronics and Automation	Electrical Machines and Apparatus
Ján Fetyko	***Jaroslav Dudrík***	***Pavel Záskalický***
Jaroslav Timko	Irena Kováčová	Jozef Fedor
Ladislav Zboray	Jozef Ondera	Bartolomej Fedor
Viliam Fedák	Pavol Fedor	Želmíra Ferková
František Ďurovský	Stanislav Fedor	Ján Kaňuch
Jaroslava Žilková	Daniela Perduková	Michal Kostelný
Vladislav Maxim	Rastislav Harčarufka	Juraj Németh
Dionýz Milly	Katarína Harčarufková – res. work.	
Le Quang Duc – res.worker	Peter Višnyi - research worker	
Full-time Ph.D. students:	Full-time Ph.D. student:	
Dusan Balara (*)	Peter Dzurko	
Ladislav Balara		
Martin Frena (*)		
Stanislav Kron		
Seman Slavomír		
Slanina Vladimír		
Tibor Takáč (*)		
Branislav Zumrík		

(*) – till 1 October 1999

Support and Technical Staff
Veronika Majerníková
Katarína Gočová
Vasiľ Graban
Alena Jakabová

3. Courses Offered in 1999/2000

3.1 M.Sc. (Undergraduate) Course (5 years)

The students are taught at the Department since the third year of study and they specialise according to their interests by choosing the optional subjects contained in the list. In such way they approach more-or-less the specialisation:

1. Electrical Drives,
2. Power Electronics,
3. Electrical Machines and Apparatus,
4. Automation of Electrical Equipment.

1. Electrical Drives

Students are prepared for designing and operating electrical drives that usually drive various working machines and mechanisms. During the study period are the students also introduced to use of power and control electronics and computer techniques, control of single and multi–motor electromechanical systems (robots, manipulators and technological lines).

2. Power Electronics

Power Electronics deals with control and transformation of electrical energy from an available into the required form. Besides the fundamental subjects the students are prepared for analysis, modelling, design, construction, and control of power semiconductor converters. They attain deeper knowledge in electronics, esp. digital electronics.

3. Electrical Machines and Apparatus

The students are taught theory, design, technology and construction of electrical machines and apparatus using classical and computer - aided design methods.

4. Automation of Electrical Equipment

The stress is put on subjects relating to electronics and microelectronics, advanced control theory, computer technique, design of control and regulation for complex systems, both from the HW and SW points of view. The goal of the study is to prepare students to design and maintain the control systems of technological processes.

Overview of the M.Sc. (Undergraduate) Course Programme

The Third Year

Duration: 14 + 14 weeks

Option Subject	Semester:	5th Lect./Lab.	6th	N° of credits	Lecturer
Compulsory Subjects					
Social Sciences		0/2 ca		2	
Control Theory		2/2 ex		5	Madarász, Bučko
Applied Electronics		2/3 ex		6	Kováčová
Electrical Machines I.		3/3 ex		7	Kostelný
El. Power Engineering I.		3/3 ex		6	Varga
Optional Subjects (students choose min. 1 subject from the following list)					
Components of Digital Control Systems		2/2 ex		5	Fedor P., Perduková
Mechanics		2/2 ex		4	Jurica
Electromechanical Systems		2/2 ex		4	Fedák, Fetyko
Applied Mathematics		2/2 ex		4	Pirč, Schrötter
Compulsory Subjects					
Power Electronics			3/3 ex	7	Dudrík
Electrical Apparatus			3/2 ex	6	Fedor J.
El–Power Engineering II.			3/2 ex	6	Varga
Electrical Machines II.			3/3 ex	6	Kostelný
Optional Subjects (students choose min. 2 subjects)					
Control Systems Software			2/3 ex	5	Fedor P.
Mechatronics Fundamentals			2/3 ex	5	Fetyko
Optional Subject from the Faculty List					
Required number of credits per year				60	

The Fourth Year

Duration: 14 + 14 weeks

Option Subject	Semester:	7th Lect./Lab.	8th	N° of credits	Lecturer
Compulsory Subjects					
Economy II.		0/2 ca		3	
Electrical Drives		3/3 ex		6	Timko
Automation of Electrical Equipment		3/3 ex		6	Fedor P.
Optional Subjects (students choose min. 5 subjects)					
State Control of Electrical Drives		2/3 ex		6	Zboray
Industrial Systems Identification		2/3 ex		6	Fedák
Control Circuits for Power Electronics		2/3 ex		6	Dudrík, Višnyi
Computer Aided Design		2/3 ex		6	Záskalický
Electrical Machines Design		3/2 ex		6	Ferková
El. Equipment for the Vehicles		2/2 ex		4	Ďurovský
Electroheat and Light Engineering		2/2 ex		4	Novák, Šefčíková
Applied SW in Electrical Engineering		1/3 ex		4	Dudrík, Fedák
User Interfaces in Control Systems		2/2 ex		4	Fedor P., Perduková
Optional Subject from the Faculty List					
Compulsory Subjects					
Economy II.			0/2 ca	3	
Controlled Drives			3/3 ex	7	Zboray

Optional Subjects (students choose min. 5 subjects)			
Electrical Apparatus Construction	2/3 ex	6	Fedor J.
Electrical Drives Design	2/3 ex	6	Milly
Complex Drive Systems	2/3 ex	6	Fedák
Control Systems for Electrical Drives	2/3 ex	6	Fedor P.
Power Semiconductor Converters	2/3 ex	6	Ondera
High-Voltage Technique	3/2 ex	6	Marton
Computer Aided Design	0/2 ca	2	Fedor S.
Control Electronics Laboratory Practice	0/2 ca	2	Fedor S.
Required number of credits per year		60	

The Fifth Year

Duration: 14 + 10 weeks

Option Semester: Subject	9th Lect./Lab.	10th Lect./Lab.	N° of credits	Lecturer
Compulsory Subjects				
Master Thesis Workshop	0/5 ca		4	supervisor
Optional Subjects (students choose min. 5 subjects)				
Special El. Machines and Apparatus	3/2 ex		6	Kostelný, Fedor J.
Semiconductor Converters Applications	2/3 ex		6	Ondera
Control of Robots and Manipulators	2/3 ex		6	Fetyko
Control Systems of Technological Lines	2/3 ex		6	Fedor P.
Industrial Drives	2/3 ex		6	Fetyko, Ďurovský
Electrical Networks and Stations	3/2 ex		6	Varga
HC Separators and Neutralisers	2/2 ex		4	Marton
Digital Control of Converters	2/2 ex		4	Višnyi
Neural and Fuzzy Control of El. Drives	2/2 ex		4	Timko
Optional Subject from the Faculty List				
Compulsory Subjects				
Business Law		3/0 ex	5	Homzová
Electronic Commerce		4/0 ca	5	Banský, Kováč
Master Thesis (Diploma Work)		0/8 ca	30	supervisor
Required number of credits per year			60	

The Department of Electrical Drives and Mechatronics ensures teaching of specialised subjects in other lines of study at the FEI and is also responsible for teaching of the following subjects in field of electrical engineering at other faculties of the Technical University:

Faculty of:

El. Eng. & Info: Technical Documentation in El. Engineering, Microprocessors, Electrical Apparatus, Electrical Drives, Controlled Drives, Electronic Elements, Electrical Machines, Electrical Drives and Power Electronics
Mechan. Eng.: Electrical Engineering, Special Electrical Drives
Mining Eng.: Electrical Engineering
Metall. Eng.: Electrical Engineering

3.2 B.Sc. (Undergraduate) Course (3 years)

The three-year Bc. degree course on Electrical and Power Engineering has been designed so that the graduates would satisfy industrial requirements. In this course the students will:

- receive fundamental theoretical knowledge in mathematics, physics, electromechanics, in electrical engineering, power electronics, electrical drives and computers,
- get practical skills in design and diagnostic of electric and electronic circuits, mainly in power semiconductor converters, motors and in controlling systems of the drives,
- get knowledge in economics and business.

Overview of the B.Sc. (Undergraduate) Course Programme

First Year

Duration: 14 + 14 weeks + 4 weeks EA I.

Subject Semester:	1st Lect./Lab.	2nd Lect./Lab.	N° of credits	Lecturer
Fundamentals of Electrical Engineering	3/1 ex		4	Orendáč
Mathematics I.	4/3 ex		8	Haščák
Physics	3/2 ex		5	Ziman
Computers and their network Services	3/2 ex		6	Jelšina
Technical Documentation in El. Engineering	2/1 ca		3	Ďurovský
Mathematics II.		3/3 ex	7	Skřivánek
Theoretical El. Engineering		3/3 ex	7	Špaldonová
Programming in C-Language		2/2 ex	5	Havlice
Electrical Measurement		2/2 ex	6	Mojžiš
Electronic Elements		3/3 ex	7	Gamec
Foreign Language	0/2 ca	0/2 ca	-	
EA I. in duration of		4 weeks	4	
Required number of credits per year			60	

Second Year

Duration: 14 + 14 weeks + 6 weeks Praxis II.

Option Semester: Subject	3rd Lect./Lab.	4th Lect./Lab.	N° of credits	Lecturer
Social Sciences I.	0/2 ca		2	
Electrical Machines	3/3 ex		7	Kostelný
Power Electronics I.	3/3 ex		7	Dudrík
Digital Control Techniques	2/3 ex		5	Fedor P., Fedor S.
Applied SW in Electrical Engineering	1/3 ex		4	Dudrík, Fedák
Electrical Machines and Apparatus		3/3 ex	6	Kostelný, Fedor J.
Power Electronics II.		3/3 ex	6	Dudrík
Automation of Electrical Equipment		3/3 ex	6	Fedor P.
Electrical Drives		3/3 ex	6	Timko
Social Sciences II.		0/2 ca	4	
Foreign Language	0/2 ex		2	
EA II. in duration of		6 weeks	5	
Required number of credits per year			60	

Third Year

Duration: 14 + 14 weeks

Option Subject	Semester:	5th Lect./Lab.	6th	N° of credits	Lecturer
Compulsory Subjects					
Ecology		2/1 ca		3	
El. Power Engineering I.		3/2 ex		6	Varga
Final Project		0/4 ca		4	supervisor
Optional Subjects (students choose min. 3 subjects)					
Automated Electrical Drives I.		3/3 ex		7	Fetyko
Power Semiconductor Systems I.		3/3 ex		7	Dudrík
Control Systems in Power Electronics		2/2 ex		5	Višnyi
Electrical Equipment for Vehicles		2/2 ex		5	Ďurovský
Robots and Manipulators		2/2 ex		5	Fetyko
Compulsory Subjects					
El. Power Engineering II.			2/2 ex	6	Kolcun
Final Project			0/7 ca	7	supervisor
Optional Subjects (students choose min. 2 subjects)					
Automated Electrical Drives II.			3/3 ex	7	Fetyko
Power Semiconductor Systems II.			3/3 ex	7	Ondera
Design of Electrical Drives			2/2 ex	5	Milly
Industrial Drives			2/2 ex	5	Ďurovský
Fundamentals of Mechatronics			2/3 ex	5	Fetyko
Required number of credits per year				60	

Abbr.: ex = exam, ca = continuing assessment

3.3 Ph.D. (Postgraduate) Course (3 years)

Students with the Master's Degree (Ing.) can apply for postgraduate course in duration of three years. According to the Edict No 131 of the Ministry of Education of Slovak Republic, the Ph.D. study continues in the branch of study 26-32-9 Electrical Engineering, particularly in one from the following specialisation:

- Electrical Drives,
- Electrical Machines and Apparatus,
- Power Electronics.

The whole postgraduate program is divided into two parts. After 18 months there is a defence of an overview work on topic of the dissertation accompanied by an exam from the specialised subjects stated by the supervisor. The further study concentrates on research only. The course is finished by a public defence of the dissertation by the end of the third year.

4. Current Research Projects

The research activity at the Department of Electrical Drives generally concentrates on

- CAD of electrical machines and apparatus,
- controlled electrical drives,
- power electronics converters with improved dynamic properties,
- applications of control theory and computers to control of complex drive systems, multi-motor drives of manufacturing lines, industrial plants and robots,
- microcomputer implementation of control algorithms.

Scientific research is carried out in collaboration with national authorities and industry.

The following research projects were carried out at the Department in 1999:

1. Special Electrical Drives of Low Power Ratings (institutional project - N° 41152)
2. Development of Control Algorithms for Non-Linear and Multi-Motor Drives (N° 1/4025/97)
3. Application of Artificial Neural Networks and Fuzzy Logic in Control of Industrial Plants (N° 1/6253/99)
4. Power High-frequency Indirect Converters with Soft Switching (N° 1/6110/99)
5. Modern Methods of Analysis and Synthesis for Multi-motor Mechatronic Systems (N° 1/6056/99)
6. Compensation and Activation of Centrifugal Forces in Vibration Equipment using Electrical Drive (N° 1/6052/99)
7. Design of Reluctance Machines with Unsymmetrical Structures (N° 5004/98)
8. Controlled Drives (institutional project - N° 41152)

1. Special Electrical Drives of Low Power Ratings for Automation

Research project N° 41152 based on institutional granting.
Duration: 1997-99
Co-ordinator: Michal Kostelný
Members: Bartolomej Fedor, Ján Kaňuch, Pavel Záskalický

Goal of the project: To design and investigate properties switched reluctance and step motors.

Research activity of the group is concentrated on:
- development and realisation of the switched reluctance motor (SRM) with axial magnetic field,
- development of a step motor with axial magnetic field,
- design of new structures of switched reluctance and step motors,
- optimisation of switching processes; calculation of currents and torque.

Publications: [C23]

2. Development of Control Algorithms for Non-Linear and Multi-Motor Drives

Supported by: grant N° 1/4025/97 of the Grant Agency for Science (VEGA).
Duration: 1997-99
Co-ordinator: Pavol Fedor
Members: Stanislav Fedor, Rastislav Harčarufka, Katarína Harčarufková, Daniela Perduková

Within the project the following results were attained:
- Two new control structures without access to state variables based on the 2nd Lyapunow method were derived and realised.
- A structure for continuous line fuzzy logic control was designed and realised.
- A washing machine fuzzy model was designed and verified with its analytical model.

Publications: [C8], [K3], [C2]

3. Application of Artificial Neural Networks and Fuzzy Logic in Control of Industrial Plants

Supported by grant N° 1/6253/99 of the Grant Agency for Science (VEGA).
Duration: 1999 - 2001
Co-ordinator: Jaroslav Timko
Members: Peter Bober, Viliam Fedák, Michal Girman, Jaroslava Žilková
Ph.D. students: Dušan Balara, Martin Frena (both till 30 September), Ján Skonc

Scientific goals of the project:
- To develop an identification structure and adaptation algorithm for identification of non-linear systems with time variable parameters.
- To perform analysis and set-up methodology of synthesis of fuzzy controllers and controllers based on artificial neural networks for industrial systems.
- To prepare a monograph for printing from solution and results of the research.

Publications: [J3], [C9], [C10], [C11], [C13], [C16], [K1]

4. Power High-frequency Indirect Converters with Soft Switching

Supported by grant N° 1/6110/99 of the Grant Agency for Science (VEGA).
Duration: 1999 - 2001
Co-ordinator: Jaroslav Dudrík
Members: Jozef Ondera, Peter Višnyi
Ph.D. student: Peter Dzurko

Goals of the project: To design and verify high-frequency indirect converters for controlled stabilised voltage and current sources of higher power (till several 10s kW) with soft switching based on bridge, or half-bridge topology.

Research activity of the group is concentrated on:
- Design of input converter circuits and a special power hf transformer.
- Design of inverter and verification of its properties by simulation in Pspice programme.
- Choice of principal control method.
- Construction of the converter.
- Design of universal impulse generator based on one-chip microcomputer.
- Design and construction of transducers of signals from sensors.
- Laboratory model of the power converter, measurement and verification of its properties.

Publications: [J5], [J6], [C1], [C3], [C4], [K6]

5. Modern Methods of Analysis and Synthesis for Multi-motor Mechatronic Systems

Supported by grant No 1/6056/99 of the Grant Agency for Science (VEGA).
Duration: 1999 - 2001
Co-ordinator: Ján Fetyko
Members: Slavomír Caban (FME TU), František Ďurovský (33%), Viliam Fedák, Zuzana Chlebová (FME TU), Vladimír Ivančo (FME TU), Vladislav Maxim (33%), Dionýz Milly (33%), Ladislav Zboray (33 %),
Ph.D. students: Martin Frena (till 30 September), Stanislav Kron, Tibor Takáč (till 30 September), Branislav Zumrík

Goals of the project: To develop modern methods of analysis of multi-motor mechatronic systems and their electromechanical subsystems and control subsystems. To perform synthesis of the non-adaptive, non-linear and neuro-fuzzy control of multi-motor meachatronic system with accounts of the interaction between electrical drive subsystems due to mechanical links.

Research activity of the group concentrates on:
- Kinematic and dynamic analysis of electromechanical subsystems for the selected mechatronic systems, predominantly for the metallurgical and paper industry and for the robotics, like:
  - continuous strip finishing mill and processing lines with the rigid or elastic mechanical links through processed material,
  - robots and manipulators with the rigid or elastic mechanical links.
- Theory and application estimators for variable parameters and same non-measurable state and disturbance variables.
- Synthesis and experimental verification of the non-adaptive, adaptive and optimal control structures for the selected mechatronic systems.

Publications: [J7], [C5], [C7], [C14], [C24], [C25], [C28], [K5]

6. Compensation and Activation of Centrifugal Forces in Vibration Equipment using Electrical Drive

Supported by grant No 1/6052/99 of the Grant Agency for Science (VEGA).
Duration: 1999 - 2001
Co-ordinator: František Ďurovský (66 %)
Members: Vladislav Maxim (66%), Le Quang Duc, Dionýz Milly (66%), Juraj N0meth, Ladislav Zboray (66 %)

Goals of the project:
The goal of the project is a design of software packages for existing up to date drive systems with dc, ac and special types of motors. The packages add to the drive an ability of dumping and activating of centrifugal forces of vibration equipments on the base of fuzzy control and state space control theories.

Publications: [J2], [D1], [C6], [C27]

7. Design of Reluctance Machines with Unsymmetrical Structures

Supported by grant N° 1/5004/98 of the Grant Agency for Science (VEGA).
Duration: 1998- 2000
Co-ordinator: Pavel Záskalický
Members: Michal Kostelný, Jozef Fedor, Ján Kaňuch, Bartolomej Fedor
Goals: To design and investigate properties of switched reluctance and step motors with dis–symetrical structures.

Goals of the project:
- Design of new structures of switched reluctance and step motors.
- Optimization of switching processes; calculation of currents and torque.

Results:
- Linear theory of the Switched reluctance motors.
- General theory on non-symmetrical structures SRM and step motors.
- Optimization of the switching angle by linearisation of the magnetic curve.
- Optimization of switching angle by non-linear substitutes of the inductances.

Publications: [J2], [D1], [C6], [C27]

8. Controlled Drives

Project N° 4131 based on institutional granting.
Duration: 1998-99
Co-ordinator: Ladislav Zboray
Members:

Goal of the project: To prepare a book on the topic.

Main Chapters: Linear Control in Frequency Domain
Linear Control in Time Domain
Control With Non–Linear Structure
Converters for Electrical Drives
Control of A.C. Drives
Control of Systems with Uncertain Parameters
Structural Schemes of Industrial Drives

5. Publications in 1999

1. Monographies

Dissertation

[D1] Le Quang Duc: Electromechanical System Switched Reluctance Motor – Vibrating Equipment. KEPM, Košice 1999 (in Slovak)

2. University Textbooks

3. University Teaching Materials

[T1] Harčarufka,R. - Harčarufková,K. - Perduková,D.: Fundamentals of Using MS Outlook. Textbook for flexible education, STU-Bratislava, LSDV, ISBN 80-227-1280-9 (in Slovak)

[T2] Harčarufka,R. - Harčarufková,K. - Perduková,D.: WORD II. Textbook for flexible education, STU-Bratislava, ISBN 80-227-1212-4 (in Slovak)

3. Papers in the Specialised Journals

[J1] Zboray,L. - Balara,L.: State Control with Decreased Sensitivity to Parameter Variations. Journal of Electrical Engineering. Vol. 50, No 1-2, 1999, pp. 28-31

[J2] Ďurovský,F.: State Control of an Induction Motor with Non-linear Observer. Journal of Electrical Engineering.Vol. 50, No 7-8, 1999, pp. 173-177

[J3] Balara,D. - Timko,J.: Estimation of Induction Motor Parameters Using Neural Networks. Journal of Electrical Engineering.Vol. 50, No 7-8, 1999, pp. 178-184

[J4] Le Quang Duc - Ferková,Ž.: Modelling of a Switched Reluctance Motor in Dynamical Performance. Journal of Electrical Engineering.Vol. 50, No 7-8, 1999, pp. 190-193

[J5] Dudrík,J. - Dzurko,P. - Višnyi,P.: Resonant Converter for Arc Welding Using Micro-computer Control. Journal of Electrical Engineering.Vol. 50, No 7-8, 1999, pp. 229 -232

[J6] Dudrík,J. - Dzurko,P - Takáč,T.: Switched Source of DC Voltage 10 - 110 V/7 A. Odborný časopis pre elektrotechniku a energetiku. č.2, 1999, pp. 30-33 (in Slovak)

[J7] Maxim,V.: Environmental Influence of Power Converters in Supply Network. Zin: Proc. of Scientific Works of environmentalistics a Process Control ENVIRAUTOM, ISBN-80-88964-13-X, Vol. 4, TU Košice 1999, str. 236 –241 (in Slovak)

4. Contributions at the International Conferences

[C1] Dudrík,J. - Dzurko,P.: Soft-Switching Phase-Shifted PWM Converter.
In: Proc. of Int. Conference microCAD ´99, Miskolc, 1999, pp.119-123

[C2] Harčarufka,R. - Harčarufková,K.: New Trends in Electrical Drives Engineering Education. In: Proc. of Int. Conference EDPE ´99, Vysoké Tatry, 5-7 October 1999, pp.165-169

[C3] Dzurko,P. - Dudrík.J.: Zero-Current Switching Half Bridge Resonant Converter for Current Sources. In: Proc. of Int. Conference EDPE ´99, Vysoké Tatry, 5-7 October 1999, pp.403-407

[C4] Dudrík,J. - Dzurko,P.: Arc Welding Using Soft-Switching Phase-Shifted PWM Full-Bridge DC-DC Converter. In: Proc. of Int. Conference EDPE ´99, Vysoké Tatry, 5-7 October 1999, pp. 392-396

[C5] Balara,L. - Zboray,L.: Robust Control of an Asynchronous Motor. In: Proc. of Int. Conference EDPE ´99, Vysoké Tatry, 5-7 October 1999, pp. 252-255

[C6] Le Quang Duc - Ferková,Ž.: Control of Switched Reluctance Motor with Minimisation of Torque Ripple. In: Proc. of Int. Conference EDPE ´99, Vysoké Tatry, 5-7 October 1999, pp. 284-287

[C7] Fetyko,J.: Conventional and State-Feedback Control System Based Feedforward Motion Control of Electrical Servo Drives – a Comparative Study. In: Proc. of Int. Conference EDPE ´99, Vysoké Tatry, 5-7 October 1999, pp. 246-251

[C8] Fedor,P. - Perduková,D. - Fedor,S.: Washing Machine Drive Fuzzy Model. In: Proc. of Int. Conference EDPE ´99, Vysoké Tatry, 5-7 October 1999, pp. 148-151

[C9] Žilková,J.: Induction Motor Variable Estimation by Neural Networks. In: Proc. of Int. Conference EDPE ´99, Vysoké Tatry, 5-7 October 1999, pp. 144-147

[C10] Balara,D. - Timko,J.: Estimation of Electrical Parameters of Induction Motor Using Neural Networks Principles. In: Proc. of Int. Conference EDPE ´99, Vysoké Tatry, 5-7 October 1999, pp. 144-147

[C11] Žilková,J.: Continuous Identification of Asychronous Motor Rotor Resistance Value. In: Proc. of Int. Workshop SEKEL ´99, Krásna -Visalaje, pp.140-143 (in Slovak)

[C12] Németh,J.: Teaching Activity of the Department (KEPaM) at Non-electrotechnical faculties of the Technical University of Košice. International Workshop SEKEL ´99, Ostrava, 1999, pp.5 (in Slovak)

[C13] Žilková,J.: State Variable Estimation of an Induction Motor.
In: Proc. of Int. Conference microCAD ´99, Miskolc, 1999, pp. 137-141

[C14] Balara,L. Robust control of a DC-motor with uncertain parameters.
In: Proc. of Int. Conference ELEKTRO ´99, Žilina, 1999, pp. 102-107

[C15] Zboray,L.: Robust Control of Electrical Drives.
In: Proc. of Int. Conference ELEKTRO ´99, Žilina, 1999, pp. 96-101

[C16] Balara,D. - Timko,J.: Estimation of Mechanical Parameters of Induction Motor Using Neural Networks Principles. Proc. Int. conf. EPE ´99, Lausanne, 1999 (CD ROM)

[C17] Harčarufka,R.: ON-LINE a WEB Education. In: Proc. of Int. Workshop „Flexible and Continuing Education", Košice, March 1999, pp. 1-4 (in Slovak)

[C18] Harčarufka,R.: Some Methodological and Technological Aspects of Training Delivery.
Invited Paper at Int. Workshop EDUCRATOS Identification and Analysis of Training Needs", Luton, England, September 1999, pp. 1-8

[C19] Harčarufka,R.: The Use of Information Technology in Education. In: Proc. of Int. Workshop „Continuing Education of Vocational School Staff", Košice, marec 1999

[C20] Záskalický,P.: Mathematical Model of a Self Starting Single Phase Permanent Magnet Synchronous Motor. In: Proc. of Int. Conference microCAD ´99, Miskolc, 1999, pp. 131-136

[C21] Záskalický,P.: Influence of Dissymetrical Placement of Reluctance Motor Poles to Inductance Course. In: Proc. of XXI. Int. Seminar, Svratka, 24.-26. mája 1999, pp. 174-177 (in Slovak)

[C22] Záskalický,P.: Historic Development of Reluctance Motors. In: Proc. of Int. Workshop SEKEL ´99, Krásná-Visalaje, Czech Republic, pp.135-139 (In Slovak)

[C23] Záskalický,P. - Záskalická,M.: Influence of Reluctance Machine Geometry to the Course of Inductance. In: Proc. of Int. Workshop SEKEL ´99, Krásná-Visalaje, ČR, pp. 144-148 (in Slovak)

[C24] Takáč,T. - Milly,D. - Maxim,V.: Comparison of Higher Harmonics of Large DC and Synchronous Drives. In: Proc. of Int. Conference microCAD ´99, Miskolc, 1999, pp. 95-99

[C25] Fetyko,J.: Motion Control of Electric Servo Drives with Conventional and State-Feedback Control Systems. Comparative Study. In: Proc. of Int. Conference microCAD ´99, Miskolc, 1999, pp. 39-44

[C26] Kováčová,I. - Kováč,D.: Simulation Models of Power IGBT and its Verifying by Measurement. In: Proc. of Int. Conference microCAD ´99, Miskolc, 1999, pp. 67-70

[C27] Németh,J.: Mathematical Model of Vibration Mill. In: Proc. of Int. Workshop SEKEL ´99, Krásná-Visalaje, ČR, pp. 121-125 (in Slovak)

[C28] Milly,D.: Possibilities to Reconstruction of Main Drives of Hot Tandem Mill in VSŽ Company. In" Proc. of XXVI Conference on Electrical Drives. Plzeň 1999, pp. 286-290 (in Slovak)

5. Contributions at the Domestic Conferences

[K1] Balara,D. - Timko,J. - Žilková,J.: Application of Artificial Neural Networks in Electrical Drives. In: Proc. of Workshop Industry Day '99 (Deň priemyslu '99), Vysoké Tatry, 1999, pp. 71-75 (in Slovak)

[K2] Perduková,D. - Harčarufková,K. - Harčarufka,R.: Experience from Education of University Employees in Field of Information Technology. Workshop on Flexible and Continuing Education. 15-16 March, 1999, Košice, pp. 11-21 (in Slovak)

[K3] Fedor,P. - Perduková,D.: Fuzzy Control in Electrical Drives. In: Proc. of Workshop Industry Day '99 (Deň priemyslu '99), Vysoké Tatry, 1999, pp. 65-70 (in Slovak)

[K4] Ďurovský,F. - Fedor,P. - Fetyko,J.: Projects of Department KEPM FEI TU of Košice for Industry. In: Proc. of Workshop Industry Day '99 (Deň priemyslu '99), Vysoké Tatry, 1999, pp. 13-16 (in Slovak)

[K5] Fetyko,J.: Control of Motion by Servodrives. In: Proc. of Workshop Industry Day '99 (Deň priemyslu '99), Vysoké Tatry, 1999, pp. 33-37

[K6] Dudrík,J. - Dzurko,P.: Modern Power Electronic Source of DC Voltage and Current.. In: Proc. of Workshop Industry Day '99 (Deň priemyslu '99), Vysoké Tatry, 1999, pp. 46-51

4. Other Publications of the Department

[O1] Fedák,V.: EPE-PEMC 2000 – the Right Step to Unification of European Power Electronics World. Editorial EPE Journal, Vol. 8, No 3-4, September 1999, p.3

[O2] Electrical Drives and Power Electronics EDPE `99. Proceedings of 13th International Conference (Editors: Fedák,V. - -Fedor,J. - Fetyko,J.). Vienala Press, Košice 1999, ISBN 80-88922-06-2, 490 p.

[O3] Deň Priemyslu`99 (Industry Day '99): "Electrical Drives and Power Electronics EDPE`99". Proceedings from the Seminar (Editors: Fetyko,J. - Fedák,V.). Vienala Press, Košice 1999, ISBN 80-88922-07-0 (in Slovak), 78 p.

6. Students' Theses

No	Name	Title	Consulting advisor
1.	Blaščák, M.:	Development of a Program for Calculation of Rise in Temperature of Universal and Single-Phase Asynchronous Motors	Kostelný, M.
2.	Brož, J.	Switched Reluctant Motor with Outer Armature	Ferková, Ž.
3.	Hutník, E.:	Robust Control of the Asynchronous Motor	Zboray, L.
4.	Ivaňák, M.:	Cage Rotor QC Equipment	Fedor, J.
5.	Kalina, N.:	Reconstruction of Main Drives of the VSŽ Hot Mill Finished Sequence	Milly, D.
6.	Királ', M.:	Modeling of the Asynchronous Motor Vector Control	Timko, J., Žilková, J.
7.	Krivda, R.:	Control of the Elevator Drive with Attenuation of the Cage Vibrations	Fedák, V.
8.	Kučera, I.:	Modeling of Frequency Controlled Asynchronous Motor with MATLAB Software	Zboray, L., Németh, J.
9.	Kušnírik, S.:	Selecting the Motor Type for Propelling of Electro-mobiles	Ferková, Ž.
10.	Onufer, J.:	Proposition of the Single Phase Synchronous Motor Magnetic Circuit	Záskalický, P.
11.	Piroh, J.:	Control of a DC Motor via MATLAB Environment	Ďurovský, F
12.	Pokorný, M.:	Regulation of Speed and Tension of the Strip Controlled by Multi-motor Drives	Bober. P.
13.	Rešková, R.:	An Analysis of Influence of Fuzzy Regulator Selected Parameters	Harčarufka, R.
14.	Seman, S.:	A Design of Traction Battery Management	Ďurovský, F., Višnyi, P.
15.	Slanina, V.:	Control of DC motor via Increased Robustness	Ďurovský, F., Višnyi, P.
16.	Smolko, V.:	Controlling Drive with Asynchronous Motor	Fedor, P.
17.	Tomko, M.:	Exploitation of the LOGO Module in Drive Control	Ďurovský, F.
18.	Varga, J.:	Fuzzy Regulators Implementation Possibilities	Harčarufka, R.
19.	Vinarčík, J.:	Robust and Self-Adjusting Regulators for Electric Drives	Fedak, V.
20.	Volesko, J.:	Regulation of Speed and Tension of the Strip in Physical Model of a Continuous Line	Perduková, D.
21.	Závacký, Ľ.:	Neural Observation of Values for Vector Control of Drives with the Asynchronous Motor	Timko, J., Žilková, J.

7. Information about Staff Members

1. Fields of Research Interests of the Teaching Staff Members

Jaroslav Timko, Professor (Prof. Ing., CSc.)
Control of AC drives (also linear ones) fed by power electronic frequency converters. Applications of neural networks in electrical drives.

Ladislav Zboray, Professor (Prof. Ing., CSc.)
Non-linear state control methods and their application to the control design of drive systems.

Jaroslav Dudrík, Associate Professor (Doc. Ing., CSc.)
Analysis, design and control of static power converters. High-frequency resonant and soft switching DC/DC converters.

Viliam Fedák, Associate Professor (Doc. Ing., CSc.)
Application of the advanced control theories for control of single- and multi-motor drives. Systems identification. Modelling of electromechanical systems.

Jozef Fedor, Associate Professor (Doc. Ing., CSc.)
Switching electrical circuits and switching apparatus. Applications of power semiconductor devices and circuits for a switching techniques.

Pavol Fedor, Associate Professor (Doc. Ing., CSc.)
Software for control and new control methods of electrical drives, parallel and distributed programming and application software for transputer system.

Ján Fetyko, Associate Professor (Doc. Ing., CSc.)
Control of electrical drives. Electric servosystems for robots Non-adaptive and adaptive control of industrial robots. Mechatronics

Irena Kováčová, Associate Professor (Doc. Ing., CSc.)
Modern power semiconductor switching devices (MOSFET, IGBT, PIN diodes) and their application in power converters.

Michal Kostelný, Associate Professor (Doc. Ing., CSc.)
Design of electrical machines, esp. switched reluctance motors of various types (with radial and axial air-gap).

Jozef Ondera, Associate Professor (Doc. Ing., CSc.)
Design and control of power semiconductor converters. Design of direct-current converter. Applications of converters for illuminating engineering and battery chargers.

Pavel Záskalický, Associate Professor (Doc. Ing., CSc.)
Structures of reluctance step motors. Linear theory of reluctance motors. Optimisation of supply and power losses calculation.

František Ďurovský, Assistant Professor (Ing., CSc.)
Control of electric drives, esp. state-space control. Design of non-linear observers. Design and debugging of programs for digital control of electrical drives.

Bartolomej Fedor, Assistant Professor (Ing., CSc.)
Switching of electrical circuits, switching devices and equipment. Application of power semiconductor devices in switching circuits.

Stanislav Fedor, Assistant Professor (Ing.)
Computer control. Surface-mounting and hybrid technologies. Design of measuring instruments for testing and diagnostic of energetic devices.

Želmíra Ferková, Assistant Professor (Ing., CSc.)
Magnetic fields in electrical machines, esp. in switched reluctance motors.

Rastislav Harčarufka, Assistant Professor, (Ing.)
Software for real-time systems with parallel or distributed architecture, based on conventional processors and/or transputers, CAD, CASE -technologies, parallel programming, and languages.

Ján Kaňuch, Assistant Professor (Ing.)
Design of disk step motor and disk reluctance motor. Application of CAD methods in design of electrical machines and devices.

Vladislav Maxim, Assistant Professor (Ing., CSc.)
Design of power components for switched reluctance drives (SRD). Analysis of SRD using PC. Simulating in Pspice.

Dionýz Milly, Assistant Professor (Ing., CSc.)
Frequency converters with sinusoidal input and output currents. Control circuits for power converters. Power factor compensation. Switched sources.

Juraj Németh, Assistant Professor (Ing., CSc.)
Models of frequency controlled AC machines, esp. with field vector oriented control. Control of electrical drives for vibration machines.

Daniela Perduková, Assistant Professor (Ing., CSc.)
Design methods and control structures for multi-motor drives. Model reference control systems.

Jaroslava Žilková, Assistant Professor (Ing.)
Applications of neural networks in electrical drives.

2. Fields of Research Interests of Research Workers

Le Quang Duc
Switched reluctance motor application to drive of the vibrating mill.

Katarína Harčarufková, (Ing.)
Real-time and programming of industrial control systems. Computer-aided control application. New education technologies (flexible-distance education, computer-based learning, etc).

Peter Višnyi, (Ing., CSc.)
Digital speed and position control of electric machines Extremely high dynamic performance and precise electrical drives of small power.

3. Supported and Technical Staff

Alena Jakabová	**-** technician
Katarína Gočová	- economist
Vasiľ Graban, (Ing.)	- technician
Veronika Majerníková	- secretary

8. Current Ph.D. students (in 1999/2000)

Ľuboš Bandurčin,	part-time Ph.D. student external form
topic:	Electric Drive for a Crane
supervisor:	Ladislav Zboray
Dušan Balara,	full-time Ph.D. student (till 30 Sept. 1999)
topic:	Neural Networks Applications in Electrical Drives
supervisor:	Jaroslav Timko
Ladislav Balara,	full-time Ph.D. student
topic:	Robust Control of Electric Drive
supervisor:	Ladislav Zboray
Peter Dzurko,	full-time Ph.D. student
topic:	High-Frequency DC-DC Power Converter
supervisor:	Jaroslav Dudrík
Štefan Fedák,	part-time Ph.D. student, external form
topic:	Control of Production Technological Lines using Artificial Neural Networks
supervisor:	Jaroslav Timko
Martin Frena,	full-time Ph.D. student (till 30 Sept. 1999)
topic:	Control of Multi-Motor Electromechanical Systems
supervisor:	Viliam Fedák
Jozef Gál,	part-time Ph.D. student, external form
topic:	Control of Linear Motor Drive using Artificial Neural Networks
supervisor:	Jaroslav Timko
Ján Gula,	part-time Ph.D. student, external form
topic:	Fuzzy-Neural Control of Technological Lines
supervisor:	Jaroslav Timko
Rastislav Harčarufka, part-time, Assistant Professor	
topic:	Fuzzy Control of Synchronous Motor Drive
supervisor:	Pavol Fedor
Stanislav Kron,	full-time Ph.D. student (since 1.10.1998)
topic:	Adaptive Control of Robots
supervisor:	Ján Fetyko
Le Quang Duc,	part-time Ph.D. student, research worker
topic:	Electromechanical System: Switched Reluctance Motor – Vibrating Equipment
supervisor:	Jaroslav Tomko/Ján Fetyko
Juraj Németh,	Assistant Professor
topic:	State Control of a VSI-Fed Asynchronous Motor
supervisor:	Pavel Záskalický
Ján Pira,	part-time Ph.D. student, external form (since 1.10.1999)
topic:	Observers in Technological Lines
supervisor:	Viliam Fedák
Slavomír Seman, f	ull-time Ph.D. student (since 1.10.1999)
topic:	Control of Multi-motor Mechatronic System
supervisor:	Ján Fetyko

Vladimír Slanina, full-time Ph.D. student (since 1.10.1999)
topic: Robust Control of Vibrating Equipment
supervisor: Ján Fetyko

Branislav Zumrík, full-time Ph.D. student (since 1.10.1998)
topic: DTC Control of AC Drives
supervisor: Viliam Fedák

Stanislav Fedor, Assistant Professor
topic: Fuzzy Controller with Disturbance Identification Designed by the Lyapunow Method
supervisor: Pavol Fedor

Tibor Takáč, full-time Ph.D. student (till 30 Sept. 1999)
topic:
supervisor: Jaroslav Tomko/Ján Fetyko

Further postgraduates (having finished their study and elaborating the thesis)

Kaňuch Ján, Assistant Professor
topic: Disc Step Motor with Axial Air - Gap
supervisor: Michal Kostelný

Jaroslava Žilková, Assistant Professor
topic: Control of AC Drive using the Estimator based on Neural Network
supervisor: Jaroslav Timko

9. Laboratories and Equipment

The Department has 19 fully equipped laboratories that are used both for research and educational purposes. The most important are:

- two laboratories for teaching of general electrical engineering subjects,
- two specialised laboratories for power electronics and electronics,
- three computer laboratories for CAD design and simulation in electrical drives, power electronics and electrical machines (ANSYS, MATLAB, PSPice, and other programs),
- two specialised laboratories for electrical drives and servosystems based on industrial systems,
- three laboratories for electrical machines.

10. Other Activities

10.1 Membership in Professional Organisations

1. International Professional Societies

- EPEA (European Power Electronics and Drives Association - Brussels): Fedák – Executive Council member, EPE General Assembly member
- EPE-PEMC-C (Power Electronics and Motion Control Council - Budapest) - established in 1996: Fedák, Timko (committee members)

2. Members of the Programme and Steering Committees of the International Conferences

- EDPE '99 Conference: Fedák (chairman), Fetyko, Fedor J., Timko, Dudrík (committee members)
- Industry Day EDPE '99 – Workshop and Exhibition: Fetyko (chairman), Dudrík, Fedák, Fedor J. (committee members)
- EPE-PEMC 2000 Conference: Fedák (gen. chairman), Fetyko (Program Committee chairman), Dudrík, Fedor J., Kostelný, Timko (committee members)

3. National Professional Bodies and Societies

- Joint Slovak Board for the Ph.D. Study in Electrical Engineering: Timko (vice-chairman), Fedák, Fedor J., Zboray – members
- Technical Standards Commissions: Ferková (Electrical Machines), Pokorný (Electrical Devices and Measurement)
- Grant Agency for Technology: Fedák
- SES (Slovak Electrotechnic Society): Fedák, Fedor, J., Fetyko, Kaňuch, Ondera, Timko, Záskalický, Zboray - members

10.2 Conferences, Meetings, and Seminars

1. 13th International Conference on Electrical Drives and Power Electronics, EDPE '99, Stará Lesná, the High Tatras, 5-7 October 1999

The EDPE Organising Committee from the Department traditionally organised the successful 13th EDPE '99 conference held in hotel ACADEMIA, Stará Lesná (the High Tatras) on 5-7 October. Its importance was underlined by the fact that it took place in the year of the 30th anniversary of the foundation of the FEEaI. 90 papers were chosen from 128 delivered abstracts and they were presented by participants from 18 countries in three plenary session, five oral, and three dialogue sessions (all in English). The proceedings contains 495 pages. For the first time in history of the conference, the proceedings also in electronic form on CD was prepared.

2. Industry Day EDPE '99 -Elektrické pohony a výkonová elektronika (Electrical Drives and Power Electronics), Stará Lesná, the High Tatras, 4 October 1999

An another event preceded the conference. It was The Industry Day held on 4 October on the same place and was devoted to dissemination of know-how, experiences and advances in fields of electrical motors, drives and power electronics. The meetings and lectures were accompanied by the round-table discussion on the latest development trends in the field and by an exhibition of the products. The proceedings on 78 pages contains the contribution presented there (in Slovak).

3. 11th Engineering Symposium-High-Tech, Herľany 1999

In May the eleventh Engineering Symposium on Advances was successfully organised by staff members (D. Perduková, R. Harčarufka, S. Fedor, K. Harčarufková) in the re-training centre of the Technical University in Herľany, near Košice. The symposium has already established a tradition among our graduates and has been devoted to exchange the knowledge between the departmental staff, graduates, students, and industrial specialists. For more information see **http://www.tuke.sk/h+h** .

10.3 International Co-operation

1. International Projects

- **Training in Electrical Engineering for Industry Automation, "ELINA"**

Leonardo da Vinci programme, Call for papers 1998
Project No SK/98/2/0538/PI/II.1.1.c/CONT
Co-ordinator: Viliam Fedák
Organisations involved: National Technical University of Athens (GR), Delft University of Technology (NL), Simulation Research Aalphen an den Rijn (NL), TU of Košice (SK), TU of Brno (CZ), ENSEM Nancy (F), Mageton Kroměříž (CZ), ZPA Křižik Prešov (SK), Slovak Chamber of Commerce and Industry (SK), Slovak Electrotechnical Society (SK)

Objectives:
1) Preparation of a curriculum for life-long open learning in EE with slight modifications taking into account the needs of local industry in each from participating countries,
2) Creation of an environment supporting the open learning,
3) Preparation the course attendees in Central European Countries (SK, CZ) to the technical and quality standards used in EU (gradually to be transformed into the legal system of the CEC).

- **Use of Modern Computer Methods in the Electrical Engineering Education - Teaching and Training in Electrical Drives and Machines Automation for Undergraduates**

CEEPUS Network Project No SK-14
Co-ordinator: Prof. Ľudovít Klug (Bratislava)
Sub–coordinator: Michal Kostelný (Košice)
Organisations involved: TU of Košice, Slovak TU Bratislava, TU Budapest, Silesian TU of Gliwice, University of Ljubljana
Objective: Exchange of experiences with utilisation modern methods in education and research in Electrical Machines, Power Electrical Engineering, High Voltage Technique, Electromagnetic Compatibility and Testing Methods. Solution of ecological problems, magnetic fields in electrical machines by FEM, solution of electromagnetic compatibility.

The staff members are also involved in the following projects where the Technical University of Košice is either the partner or presents a co-ordinating institution:

- **Promotion of the Quality of Vocational Training through Vocational School Teacher training, "PROQUA"**

- **English for Specific Purposes in ES and IT, "ESPESIT"**
  Leonardo da Vinci SK/98/1/89012/PI/III.1a/FPI

- **Communications, Education and Employment for Women through the use of IT, "CEEWIT".** Socrates project

- **Educational Advisory and Consultation Services and Development of Educational Standards for Vocational Training, "EDUCTRATOS"**
  Leonardo da Vinci SK/98/1/89012/PI/III.1a/FPI SK/98/2/05020/PI/II.1.1.b/FPC

- **Professional Improvement of Management in Administration, "PRIMA"**
  TEMPUS S_JEP-11274-96

- **Human Resources Support For Managing Modern Broadband Telecommunication Networks, "TELE-HUMAN",** Leonardo da Vinci, N°: SK/98/2/06420/PI/II.1.1.c/CONT

2. Visits to Foreign Institutions

- Vrije Univeritat Brussel, B. Executive Council EPE Association and Int. Steering Committee of EPE '99 Conference, 23-29 January, - Fedák
- microCAD '99 Int. Conference, University of Miskolc, 25 Ferburary – Fetyko, Dzurko, Takáč, Žilková
- CEBIT Hannover, D. World exhibition, 21-24 March - Fedák
- Czech TU, Prague, CZ. Int. Symposium on Electrical Machines, 27-29 May, Kaňuch
- Plzeň, CZ. XXVI Conference on Electrical Drives, 7-11 June – Milly
- Universita di Roma TRE, Roma, I. Summer school on modern control theroy with application to mechanical systems. TEMPUSPhare S_JEP 11366-96 „FLACE", 6-19 June - Perduková
- TU Brno, CZ . XXI Int. Seminar on Electric Machines, 23-26 May - Záskalický
- University of Miskolc, HU. Int. TEMPUS Workshop, 29 June - Fedák, Fedor J., Fetyko
- EPFL Lausanne, CH. EPE '99 Conference, 5-11 September, - Balara D.; ISC, EC, Genaral Assembly EPE - Fedák
- VUB Ostrava. Int. Workshop SEKEP '99, 14-17 September - Fedor J., Záskalický
- NVS, Oslo. Meeting of the methodological group. Project CEEWIT (Leonardo da Vinci Programme), 25-27 September - Harčarufka
- TELECOM '99 Geneva, CH. World exhibition, CH. 10-16 October - Fedák
- University of Luton, LBS, Luton, UK. Workshop on: "Vocational Training Needs Identification and Analysis", granted by project EDUCRATOS (Leonardo da Vinci Programme), 25-31 October, Harčarufka

2. Visits from Abroad

- Mgr. inž. Tomasz Trawinski, PL, (2-16 March 1999), granted by CEEPUS No SK-14
- Mgr. inž. Gregorz Ombach, PL, (15 February – 1 March 1999), granted by CEEPUS No SK-14

3. Study Stays Abroad

- Dzurko, TU Budapest, 1-30 June, granted by CEEPUS No SK-14

Direct Contact to Staff Members and Ph.D. Students

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Slanina	Ing.	2275	
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9th International POWER ELECTRONICS and MOTION CONTROL Conference

EPE-PEMC 2000

5-7 September 2000

Košice, Slovak Republic

ANNOUNCEMENT

PEMC Council - Secretariat in Budapest, Hungary in co-operation with
European Power Electronics and Drives Association - Secretariat in Brussels,
are pleased to announce

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Organisers: **Technical University of Košice, Slovak Republic**
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Contributions are invited in the following topics:

1. Power Semiconductor Devices
2. Power Converters
3. Industrial Drives and Applications
4. Motion Control
5. Identification, Sensing, Observing
6. Electrical Machines, Actuators
7. Emerging Technologies
8. Mechatronics, Robotics
9. Electromagnetic Compatibility
10. Power Electronics in Electrical Energy Generation, Transmission and Distribution
11. Applications of Power Electronic Systems
12. Micromachines, Microactuators Microelectromechanical Systems
13. Other Related Areas, Education

Deadlines:

- Registration for exhibition **31 January 2000**
- Notification of provisional acceptance **28 February 2000**
- Submission of final manuscripts, preliminary registration **15 May 2000**

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