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1. Highlights

This is the first activity report of the newly established Department of Electrical and Computer Engineering (ECE) at the University of Cyprus. The first faculty member of the ECE Department was hired in 2001, while the Department admitted its first undergraduate and postgraduate students in September 2003. The ECE Department is one of four departments in the School of Engineering, which was also established at the same time. It offers degrees in Electrical Engineering and in Computer Engineering. Specifically, it offers a 4-year undergraduate degree (equivalent to a B.Sc.), an M.Sc. degree, and a Ph.D. degree in Electrical Engineering, and the corresponding degrees in Computer Engineering.

This biennial report covers the educational and research activities of the new department, between the time of admitting its first undergraduate students in September 2003 and the end of August 2005. The objective of this report is to inform the scientific community, in Cyprus and abroad, of the activities and progress of the Department in the aforementioned period. Through this report we seek to increase the visibility of the Department and foster collaboration with industry and other institutions.

During these two years, the Department has been successful in initiating its academic programs, which have attracted high quality postgraduate and undergraduate students, and in establishing itself as a top rate research department in Electrical and Computed Engineering, as evident by several international research achievements of its faculty.

Faculty

During the period 2003-05, one of the main goals of the newly established Department of Electrical and Computer Engineering was to recruit high quality faculty. The academic personnel hired in the ECE Department is a blend of experienced academics with significant research achievements and high potential junior faculty working in innovative research areas of Electrical Engineering and Computer Engineering, which are at the forefront of technological developments. The experience and enthusiasm brought in by the new faculty was instrumental in the work that was required to set up the new ECE academic programs at the University of Cyprus, both at the undergraduate and postgraduate level. At the same time, particular emphasis was placed on the ability of the new faculty to continue carrying out world-class research in their respective fields, despite the initial lack of research infrastructure in the new department. This goal has been achieved to a large degree, as indicated by the research productivity and quality described in the Research section of this biennial report.

Undergraduate Program

The Department accepted its first 25 undergraduate students in September of 2003 through the Cyprus Ministry of Education University Entrance Exams. An additional 30 undergraduate students were admitted in September of 2004, with the Department ranking high among candidate preferences in both years. The faculty and staff of the Department have been successful in launching the programs of study in a very short time period and in creating teaching laboratories that enable the students to get valuable experience in laboratory experimentation in electrical and computer engineering. With a small number of students per class, compared to corresponding departments in other universities, the students receive close personal attention and guidance.

The creation of the two programs of study and the establishment of the laboratories have clearly been the highlights of the undergraduate program for our young Department. In addition, as a service to the general community of the University of Cyprus, we developed and are currently offering two general engineering courses that can be taken as electives by students of other departments. A Lego robot...
competition has also been established for the first-year students of our Department, which aims at honing the students’ skills in the design, creativity, and implementation of an engineering problem.

**Postgraduate Program**

The period 2003-2005 was one of significant developments in the postgraduate program of the Department. The Ph.D. program in Electrical Engineering and the Ph.D. program in Computer Engineering were launched in the Fall of 2003. Seven high quality candidates were admitted in these programs and they have already become scientifically productive as evident by their high quality research output during the past two years. The following year, in the Fall of 2004, the Department began offering an M.Sc. degree in Electrical Engineering. That year, another seven Ph.D. and five M.Sc. students were admitted, further strengthening the postgraduate program. Preparations are also underway for the introduction of the M.Sc. degree in Computer Engineering in September 2005, thus completing the list of postgraduate degrees designated for the Department.

**Research**

Research plays a central role in the activities of the Department. Despite the relatively small number of faculty and the fact that the Department is still at an early stage in its development, we have the vision of creating an inspiring and productive environment, where high quality theoretical and applied research can be carried out. Since this was the first two years of admitting postgraduate students, most of the research activity was the result of the new faculty’s continuing research from their previous institutions. The Department has achieved some notable research distinctions during the period Sept. 2003 – Aug. 2005. Specifically, there were 140 refereed publications, which correspond to about 7 publications per faculty per year. Of these publications, 41 were journal publications in some of the most prestigious journals in the field, including IEEE, OSA, SIAM, ACM, AIAA transactions and journals.
The ECE Department was successful in attracting significant research funding. Specifically, the faculty in the Department were awarded 16 research projects, totaling more than 1,250,000 Euros (715,827 Cyprus Pounds). It is important to note that about 80% of this research funding was from external sources, while 20% was from internal, competitive, University research programs. The high quality and visibility of the research program that is being carried out in the ECE Department, is evident by the prestigious positions that ECE faculty members hold, such as Editor-in-Chief of the IEEE Transactions on Neural Networks, Associate Editor of the IEEE Transactions on Automatic Control, Chair of the IEEE CSS Technical Committee on Intelligent Control, Vice President for Conferences of the IEEE Computational Intelligence Society, Members of International Program Committees for several conferences, etc.

Outreach

The Electrical and Computer Engineering Department has initiated various outreach activities to local high schools, local industry, as well as other professional organizations. The objective of these outreach efforts is fivefold: (1) to make the community aware of the presence of the new department; (2) to establish collaborations with the local industry; (3) to promote the Department and the University of Cyprus as a favorite destination for Cypriot students who went to excel in their fields; (4) to educate the public on technological issues that are of current interest and that affect the quality of life of the local population; and (5) to contribute to the government efforts of enhancing the competitiveness of the Cyprus economy in high-technology enterprises.

Outreach activities of our Department, as they will be detailed in later sections of this report include a number of publications, planned talks, meetings and workshops, bilateral agreements and entrepreneurial activities. The Department’s outreach activities include the first publication of a newsletter, called “High Frequencies” (Ψηλές Συχνότητες), which provides general interest articles and news and activities of the Department. In addition, the Department organizes talks, seminars and workshops for the general public, including a workshop for the encouragement of young women towards engineering and applied sciences. The faculty of the Department is also involved in entrepreneurship activities, with two of its members participating in the winning teams of the first two annual Cyprus entrepreneurship competitions.

Faculty – August 2005

Demographics

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Ranks

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<tr>
<td>Visiting Faculty</td>
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</table>
2. Faculty and Staff

2.1 Faculty

The Department of Electrical and Computer Engineering at the University of Cyprus has been able to attract world-class faculty with significant research and teaching experience. The personnel of the ECE Department is considered by far the most important resource in achieving the high goals that have been set forth. A short biography of each faculty member, in alphabetical order, is given below.

Charalambous D. Charalambous, Associate Professor

Research Interests:
Theory and applications of stochastic processes and systems subject to uncertainty, communication systems, stochastic filtering, decision, control, queuing systems, large deviations and information theory.

Charalambous D. Charalambous received the B.S. degree in 1987, the M.S. degree in 1988, and the Ph.D. in 1992, all in Electrical Engineering from Old Dominion University, Virginia, USA. He joined the Department of Electrical and Computer Engineering at the University of Cyprus in 2003 as an Associate Professor. In 2005 he was elected Associate Dean of the School of Engineering. Prior to joining the University of Cyprus, he was an Associate Professor at the University of Ottawa, School of Information Technology and Engineering (1999-2003), and an adjunct Professor with McGill University (1999-2002). He has served on the faculty of McGill University, Department of Electrical and Computer Engineering, as a visiting faculty, from 1995 to 1999. In the period 1993-1995 he was a Post-Doctoral Fellow at Idaho State University, Engineering Department. Dr. Charalambous is leading a research group in Information, Communication and Control of Complex Systems. He served as an Associate Editor of the IEEE Transactions on Automatic Control, 2002-2004, and he was a member of the Control System Society Conference Editorial Board. He was a member of the Canadian Centers of Excellence through MITACS (the mathematics of information technology and complex systems), 1998-2001. In 2001 he received the Premier’s Research Excellence Award of the Ontario Province of Canada. His research received funding from the Natural Science and Engineering Research Council of Canada (NSERC), the Communications Research Center of Canada (CRC), the Department of Defense of Canada (DND), the Communication and Information Technology of Ontario (CITO), the Cyprus Research Promotion Foundation, the University of Cyprus, and the European Commission.

Georgios Ellinas, Assistant Professor

Research Interests:
Optical networks, packet switching, access networks, network security and control plane design, fault detection and identification / isolation, failure protection/restoration, integrated routing, WDM network and switch fabric architectures, multicasting, traffic grooming

Georgios Ellinas holds a B.S. (Summa Cum Laude), M.S., M.Phil, and a Ph.D. in Electrical Engineering from Columbia University, USA. He joined the Department of Electrical and Computer Engineering at the University of Cyprus as an Assistant Professor in 2005. Prior to joining the University of Cyprus, Dr. Ellinas served from 2002 to 2005 as an Associate Professor of Electrical Engineering at City College of the City University of New York. Before joining the academia, he was a senior network architect at Tellium Inc. In this role, he worked on lightpath provisioning and fault restoration algorithms in optical
mesh networks, and the architecture design of the MEMS-based all-optical switch. Dr. Ellinas also served as a senior research scientist in Telcordia Technologies' (formerly Bellcore) Optical Networking Research Group. He performed research for the Optical Networks Technology Consortium (ONTC), Multiwavelength Optical Networking (MONET) and Next Generation Internet (NGI) DARPA funded projects from 1993 to 2000. Dr. Ellinas also served as an Adjunct Assistant Professor at Columbia University and the University of Maryland, in 1999 and 2000 respectively. He has published more than 70 journal and conference proceedings papers and 3 book chapters. He is also the holder of 24 U.S. and international patents on optical networking. He is a member of IEEE and OSA and has served as a member of the technical program committees for the OFC, LEOS Annual Meeting, SPIE Photonics East, Globecom, ICC, and APOC conferences. He was the Chair of the Networks subcommittee for OFC 2004 and has served as a guest editor for the IEEE Journal of Selected Areas in Communications for a special issue on Optical Networks.

George E. Georgiou, Assistant Professor

Research Interests

Electromagnetics and plasma physics for food processing, environmental and biomedical applications, BioMEMS, nanotechnology and power systems, numerical algorithms applied to the characterization of multiphysics problems, such as DNA sequencing, lightning and gas discharges.

George E. Georgiou received his B.A. (1995), M.Eng (1996), M.A (1997) all with distinction and Ph.D. (1999) degrees from the University of Cambridge, U.K. He continued his work at the University of Cambridge in the capacity of a Fellow at Emmanuel College for a further three years (1999-2002). In 2002, he joined the Department of Electronics and Computer Science at the University of Southampton as a Lecturer, where he served as undergraduate course leader in Electrical Engineering. He joined the Electrical and Computer Engineering Department at the University of Cyprus in 2004 as a Visiting Assistant Professor and then as an Assistant Professor in 2005. Dr. Georgiou has published more than 60 papers in international journals and conference proceedings. In 1999, he received the outstanding paper award by the Journal of Microwave Power and Electromagnetic Energy. Dr. Georgiou is also actively promoting the entrepreneurship role academics can play in society, and the commercialization of cutting edge technology that stems from academic inventions. One of his ideas was a winner of the 2001 £50k innovation award organized by the Cambridge University Entrepreneurs and as a result a company has since been launched to commercialize this technology. He is also a founding member of the newly established Electromagnetic Measurements and Spectrum Certification Laboratory.

Julius Georgiou, Lecturer

Research Interests:

Low-power analog and asynchronous-digital application specific integrated circuits (ASICs), implantable biomedical devices, bioinspired electronic systems, silicon-on-insulator design, sensors and related systems.

Julius Georgiou received his B.Sc. and M.Eng. degrees in Electrical and Electronic Engineering and Ph.D. degree in Biomedical Electronics from Imperial College, U.K. in 1998 and 2003 respectively. During the last two years of his Ph.D. he was heavily involved in a technology startup company, Toumaz Technology, as Head of Micropower Design. In 2004 he joined the Johns Hopkins University, USA as a Postdoctoral Fellow, before joining the University of Cyprus in 2005. He is a member of the IEEE Circuits and Systems Society, the BioCAS Technical Committee, as well as a member of the IEEE Circuits and Systems Society Analog Signal Processing Technical Committee.
Elias Kyriakides, Lecturer

Research Interests:
Modeling and parameter estimation of synchronous machines, electric load forecasting, renewable energy sources, security and reliability of the power system network, optimization of the teaching methods in power engineering using the Internet and modern learning techniques.

Elias Kyriakides received the Diploma of Technician Engineer in Electrical Engineering from the Higher Technical Institute, Nicosia, Cyprus in 1996 and the B.Sc. degree in Electrical Engineering from the Illinois Institute of Technology, Chicago, IL, USA in 2000. He received the M.S. and Ph.D. degrees in Electrical Engineering from Arizona State University, Tempe, AZ, USA in 2001 and 2003 respectively. He has worked as a Research Associate at Arizona State University from 8/2000-12/2003 and as a Faculty Research Associate from Jan.-July 2004. From Aug. 2004 to July 2005 he was a Visiting Lecturer at the Department of Electrical and Computer Engineering at the University of Cyprus. Currently, he is a Lecturer in the same department. Dr. Kyriakides is working in the area of electric power engineering. He is a Member of the IEEE, the IEE, and the Technical Chamber of Cyprus. He is a reviewer for a number of journals including the IEEE Transactions on Power Delivery, the IEEE Transactions on Power Systems, and the IEEE Transactions on Education. He was the recipient of the Palais Outstanding Doctoral Student Award at Arizona State University (2004), the third prize in the IEEE poster-paper session and contest for the paper entitled "On-line identification of generator and exciter parameters" (2002), the Alumni association award at the Illinois Institute of Technology (2000), and the Presidential award at the Higher Technical Institute (1996).

Maria K. Michael, Lecturer

Research Interests:
Design & test automation for deep-submicron VLSI/ULSI (timing verification, testing and fault diagnosis), digital systems and SoCs testing and testable design, logic synthesis and verification.

Maria K. Michael received B.S. and M.S. degrees in Computer Science from Southern Illinois University in 1996 and 1998, respectively. She worked as a Research Assistant for the Electrical and Computer Engineering (ECE) Department of the University of Arizona, Tucson, during 1998-1999, and for the ECE Department of Southern Illinois University during 1999-2002, where she completed the Ph.D. degree in Engineering Sciences (specialization in Computer Engineering). She taught as a Lecturer at the ECE Department at Southern Illinois University during 2001-2002, and as a Visiting Assistant Professor of Computer Science and Engineering at the University of Notre Dame during 2002-2003. She joined in the Electrical and Computer Engineering Department at the University of Cyprus in 2003. She is a Member of the IEEE (Computer Society, Circuits and Systems Society, Test Technology Technical Council, Society of Women Engineers) and the ACM (Special Interest Group on Design Automation) and a reviewer for a number of journals and international conferences.

Christos G. Panayiotou, Assistant Professor

Research Interests:
Optimization and control of discrete-event systems with applications to computer communication networks, wireless and sensor networks, computer simulation, manufacturing and transportation systems.

Christos Panayiotou received a B.S. and a Ph.D. degree in Electrical and Computer Engineering from the University of Massachusetts at Amherst, USA in 1994 and 1999 respectively. He also received an
MBA from the Isenberg School of Management, at the aforementioned university in 1999. He joined the University of Cyprus as an Assistant Professor of Electrical and Computer Engineering in 2003. From 1999 to 2002 he was a Research Associate at the Center for Information and System Engineering (CISE) and the Manufacturing Engineering Department at Boston University, USA. Between 2002-03 he was a Visiting Lecturer in the Electrical and Computer Engineering Department at the University of Cyprus. He is an Associate Editor for the Conference Editorial Board of the IEEE Control Systems Society.

**Constantinos Pitris, Lecturer**

**Research Interests:**
Lasers, biomedical optics, optical coherence tomography, ultrasound imaging, medical instrumentation, biomedical signals and systems, medical diagnostics.

Constantinos Pitris received the B.S. Honors degree in Electrical Engineering and the M.S. degree in Electrical Engineering from the University of Texas at Austin, and the Ph.D. in Electrical and Medical Engineering from the Massachusetts Institute of Technology, in 2000. He also received the MD degree (Magna Cum Laude in Medicine) from the Harvard Medical School in 2002. He has worked as a research assistant at the University of Texas and Massachusetts Institute of Technology and as a postdoctoral associate at the Wellman Laboratories of Photomedicine of the Massachusetts General Hospital and Harvard Medical School. The overlying goal of his research is the introduction of new technologies in clinical applications for the improvement of the diagnostic and therapeutic options of modern health care systems to directly impact patient prognosis and outcome. He was appointed a Lecturer in the faculty of Electrical and Computer Engineering at the University of Cyprus in June 2002. He is an active member of the Optical Society of America and a reviewer for Optics Letters, Applied Optics and Biomedical Optics.

**Marios M. Polycarpou, Professor, Interim Department Head**

**Research Interests:**
Intelligent systems and control, adaptive and neural control systems, computational intelligence, fault diagnosis, cooperative control and distributed agents, water distribution networks, biomedical engineering applications.

Marios M. Polycarpou received the B.A. (Cum Laude) degree in Computer Science and the B.Sc. (Cum Laude) degree in Electrical Engineering both from Rice University, Houston, TX, USA in 1987, and the M.S. and Ph.D. degrees in Electrical Engineering from the University of Southern California, Los Angeles, CA, in 1989 and 1992 respectively. In 1992, he joined the University of Cincinnati, Ohio, USA, where he reached the rank of Professor of Electrical and Computer Engineering and Computer Science. In 2001, he was the first faculty to join the newly established Department of Electrical and Computer Engineering at the University of Cyprus, where he is currently a Professor and Interim Department Head. Dr. Polycarpou has published more than 150 articles in refereed journals, edited books and refereed conference proceedings, and is the holder of 3 patents. He is currently the Editor-in-Chief of the *IEEE Transactions on Neural Networks*. He was the recipient of the William H. Middendorf Research Excellence Award at the University of Cincinnati (1997) and was nominated by students for the Professor of the Year award (1996). He is an Associate Editor of two international journals and past Associate Editor of the *IEEE Transactions on Neural Networks* (1998-2003) and of the *IEEE Transactions on Automatic Control* (1999-2002). He served as the Chair of the Technical Committee on Intelligent Control, IEEE Control Systems Society (2003-05) and as Vice President, Conferences, of the IEEE Computational Intelligence Society (formerly IEEE Neural Network Society) (2002-03). He has been invited as Keynote Plenary Speaker at several international conferences and served as General Chair of the joint 2005 IEEE
International Symposium on Intelligent Control and 2005 Mediterranean Conference on Control and Automation. Dr. Polycarpou’s research has been funded by DARPA, US Air Force, European Commission, American Water Works Association (AWWA), Federal Highway Administration (FHWA), ONR, NASA, Ohio DOT, US Army, and the Cyprus Research Promotion Foundation.

Stavros Toumpis, Lecturer

**Research Interests:**

Wireless communications, with a special emphasis on various types of wireless communication networks, such as 3rd and future generation cellular networks, wireless ad hoc networks, sensor networks, hybrid topologies, etc.

Stavros Toumpis received the Diploma in Electrical and Computer Engineering from the National Technical University of Athens, Greece, in 1997, the M.S. degrees in Electrical Engineering and Mathematics from Stanford University, CA, in 1999 and 2002, respectively, and the Ph.D. degree in Electrical Engineering, also from Stanford University, in 2003. From 1998 to 1999, he worked as a Research Assistant for the Mars Global Surveyor Radio Science Team, providing operational support. From 2000 to 2003, he was a Member of the Wireless Systems Laboratory, at Stanford University. From Aug. 2003 to Aug. 2005, he was a Senior Researcher with the Telecommunications Research Center Vienna, in Vienna, Austria. He joined the University of Cyprus as a Lecturer of Electrical and Computer Engineering in 2005.
2.2. Visiting Faculty and Short-Term Visitors

**Peter Caines, Professor, McGill University, Canada**

**Research Interests**
Systems and control theory, hybrid and non-linear systems, hierarchical control and large scale systems, logic control systems, adaptive control, stochastic filtering, identification and control, applications to robotics, air traffic control, industrial processes, manufacturing, communication networks.

**Jay Farrell, Professor, University of California, Riverside, USA**

**Research Interests**
Learning control systems (desired approximator properties, and conditions for exponential stability of both the state and approximator parameters), autonomous vehicles (transportation systems and chemical plume tracing), global positioning systems (differential GPS/INS system)

**Chrysanthe Preza, Research Associate, Washington Univ. in St. Louis, USA**

**Research Interests**
Imaging science and estimation theory with applications in multidimensional light microscopy, medical imaging, hyperspectral imaging, remote sensing, and automatic target recognition.
2.3 Administrative and Technical Staff

Skevi Chrysanthou
Administrative Assistant

Irene Triantafillidou
Administrative Assistant

Filippos Filippou
System Administrator

Chara Skouteli
System Administrator
### Undergraduate Program – August 2005

#### Demographics

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#### Entrance Examinations

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3. Undergraduate Program

September 2003 marked the first time that high school graduates could compete for one of the 25 positions offered by the Department through the Cyprus Ministry of Education University Entrance Exams. In September 2004, the Department admitted another 30 undergraduate students. Despite its young age, the Department ranked high among candidate preferences and securing a position was not easy. For the first two years of the Department’s operation, several of the successful candidates had to first complete their military service in the Cyprus National Guard. Their positions were filled through a secondary admissions process.

The first two years of the undergraduate program were both difficult and extremely rewarding for the faculty and staff of the Department. During these two years the programs of study of the Department were established and several teaching laboratories were created. The faculty and staff of the Department have been successful in launching the programs of study in a very short time period and in creating teaching laboratories that enable the students to get valuable experience in laboratory experimentation in electrical and computer engineering.

Undergraduate education is a crucial component of the Department’s activities. Since the number of admitted students is small, as compared to corresponding departments in other universities (e.g., in Greece) we are able to offer personal attention to the students. We monitor closely their academic progress and we provide advice when needed or sought. Every student is assigned an academic advisor who can guide them and help them throughout their studies.

Apart from teaching the core courses of Electrical and Computer Engineering, the Department, as a service to the general community of the University of Cyprus, offers courses that can be taken as general electives by students of other departments. An annual Lego robot competition has also been established for the first-year students of the Department, which aims at honing the students’ skills in the design, creativity, and implementation of an engineering problem.
3.1 Undergraduate Programs of Study

The mission of the Department of Electrical and Computer Engineering at the University of Cyprus is to provide a comprehensive, state-of-the-art education that prepares students to be successful in engineering practice and advanced studies. It is envisioned that the Department’s graduates will command the fundamentals of Electrical and Computer Engineering and will have gained in-depth knowledge in one or more specialization areas. Furthermore, the Department’s faculty aspires to infuse in its students the values, attitudes and vision that will facilitate the development of well rounded, educated, productive, and ethical individuals with strong character, and life-long learning abilities. These objectives are met through programs of study that consist of basic mathematics and science courses, core courses that promote ECE fundamentals and technical electives that provide in-depth specialization in various technology areas. The programs encourage a balanced mixture between theoretical and applied work.

The undergraduate degrees offered by the Electrical and Computer Engineer Department are four-year Bachelors degrees in Electrical Engineering and in Computer Engineering. The first and second years of the Electrical Engineering (EE) and Computer Engineering (CE) programs are common. Students are initially admitted into the Department of Electrical and Computer Engineering. By the end of their 2nd year, students select, in consultation with their academic advisor, to enter either the EE or CE program.

During the first two years, the program of study is structured to provide students with a rigorous body of knowledge in mathematics, physics and electrical engineering fundamentals, which is essential in achieving a deep understanding of more advanced electrical engineering topics. In the third year the students receive training in more advanced but fundamental topics in electrical or computer engineering. In the fourth year, students have the flexibility to select elective courses from a variety of specialization areas according to their individual interests. In addition, the fourth year also includes a design project, which can be chosen from a variety of projects offered by the faculty. These projects could be small research-type projects or practical engineering projects that originate from the faculty or industry collaborators. For a successful completion of the project, the students are required to research, analyze, propose, implement and present their design proposal and implementation. The 4th-year projects could be individual or team projects that are intended to prepare students in addressing challenging engineering problems, which require collaboration with other students and integration of electrical engineering knowledge.

The undergraduate programs of study can be seen in more detail on the next page.

Scenes from the Introduction to Design and Engineering Laboratory (ECE 100), left, and the Circuits and Measurements Laboratory (ECE 203), right.
### Program of Study - Years 1 & 2 (EE and CE)

**FIRST YEAR**

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<th>Autumn Semester (15cu)</th>
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<td>PHY 132 General Physics II: Electricity and Electromagnetism and Optics (4cu)</td>
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<tr>
<td>MAS 101 Calculus I (4cu)</td>
<td>MAS 102 Calculus II (4cu)</td>
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<tr>
<td>BIO 100 Introduction to Modern Biology (3cu)</td>
<td>CS 131 Programming Principles I (4cu)</td>
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<tr>
<td>ECE 100 Introduction to Design and Engineering [LAB-1] (4cu)</td>
<td>ECE 102 Electrical Circuits and Networks (3cu)</td>
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<tr>
<td>ENG 104 Topics in Academic English: Technical Writing (3cu)</td>
<td>ENG 100 English Language (3cu)</td>
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**SECOND YEAR**

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<td>PHY 133 General Physics III: Classical and Quantum Mechanics (4cu)</td>
<td>MAS 009 Mathematics IV: Linear Algebra and Ordinary Differential Equations (4cu)</td>
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<td>MAS 008 Mathematics III: Multivariate Calculus and Linear Algebra (4cu)</td>
<td>ECE 210 Digital Logic Design (3cu)</td>
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<tr>
<td>CS 231 Data Structures and Algorithms in Computer Engineering (3cu)</td>
<td>ECE 211 Digital Systems Laboratory [LAB-3] (2cu)</td>
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<td>ECE 203 Circuits and Measurements Lab [LAB-2] (3cu)</td>
<td>ECE 220 Signals and Systems I (3cu)</td>
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<td>ENG 104 General Free Elective Course (3cu)</td>
<td>ECE 205 Electronic Circuits and Networks I (3cu)</td>
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### Program of Study - Years 3 & 4 (EE)

**THIRD YEAR**

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<tr>
<td>ECE 320 Signal and Systems II (3cu)</td>
<td>ECE 324 Introduction to Random Signals and Systems (3cu)</td>
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<td>ECE 212 Computer Organization and Microprocessors (4cu)</td>
<td>ECE 326 Dynamic Systems and Control (3cu)</td>
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<td>ECE 331 Electromagnetic Fields (3cu)</td>
<td>ECE 306 Electronic Devices Lab [LAB-5] (3cu)</td>
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<td>ECE 305 Electronic Circuits and Networks II [LAB-4] (4cu)</td>
<td>ECE 359 Introduction to Communication Systems (3cu)</td>
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**FOURTH YEAR**

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<td>ECE 401 Capstone Design Project (3cu)</td>
<td>ECE 402 Capstone Design Project (3cu)</td>
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<td>PBA 459 Entrepreneurship (3cu)</td>
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<td>ECE xxx Elective course (3cu)</td>
<td>ECE xxx Elective Course (3cu)</td>
</tr>
<tr>
<td>ECE xxx Elective course (3cu)</td>
<td>xxx xxx General Free Elective Course (3cu)</td>
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### Program of Study Years 3 & 4 (CE)

**THIRD YEAR**

<table>
<thead>
<tr>
<th>Autumn Semester (17cu)</th>
<th>Spring Semester (15cu)</th>
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<tbody>
<tr>
<td>ECE 320 Signal and Systems II (3cu)</td>
<td>ECE 324 Introduction to Random Signals and Systems (3cu)</td>
</tr>
<tr>
<td>ECE 212 Computer Organization and Microprocessors (4cu)</td>
<td>ECE 360 Computer Networks (3cu)</td>
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<tr>
<td>ECE 312 Discrete Analysis and Structures (3cu)</td>
<td>ECE 315 Engineering of Computing (3cu)</td>
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<td>ECE 313 Engineering of Operating Systems (4cu)</td>
<td>ECE 311 Computer Architecture (3cu)</td>
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**FOURTH YEAR**

<table>
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<tr>
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<tbody>
<tr>
<td>ECE 401 Capstone Design Project (3cu)</td>
<td>ECE 402 Capstone Design Project (3cu)</td>
</tr>
<tr>
<td>PBA 459 Entrepreneurship (3cu)</td>
<td>ECE xxx Elective Course (3cu)</td>
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<td>ECE 317 Distributed Systems (3cu)</td>
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<td>ECE xxx Elective Course (3cu)</td>
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<tr>
<td>ECE xxx Elective course (3cu)</td>
<td>xxx xxx General Free Elective Course (3cu)</td>
</tr>
</tbody>
</table>
3.2 Teaching Laboratories

Three teaching laboratories for the Department of Electrical and Computer Engineering were created during the first two years of its operation. A new Introduction to Design and Engineering Laboratory was developed, in collaboration with the other departments in the School of Engineering, that has as a goal the introduction of the first-year students to the fundamentals of engineering and the development of their design and implementation skills through a robotic competition. In addition, a new, state-of-the-art, Circuits and Measurements Laboratory was created for the instruction of second-year students in measurements, evaluation, and validation of models through experimentation in electrical and electronic circuit design. A third laboratory, namely the Digital Circuits and Systems Laboratory, was created for the instruction of second-year students in the design and implementation of digital logic circuits and systems.

Introduction to Engineering Laboratory

The Department, in collaboration with the rest of the School of Engineering Departments, has established a new Introduction to Design and Engineering Laboratory.

◄ Experimenting in the Introduction to Design and Engineering Laboratory

This laboratory consists of two main parts. First, the students participate in a series of five engineering demonstrations that enable the students to observe and/or perform experiments in various fields of engineering. This part includes the following five experiments:

- **Basic circuits and measurements** where students are required to build simple circuits and learn how to use basic instruments such as multi-meters and oscilloscopes.
- **Lasers and optics** where students experiment with laser beams and use them to transmit information.
- **Inverted pendulum** where students are introduced to the basic principles of robotics and feedback control.
- **Strength of materials and structures** where students observe how the structure of an assembly affects its strength.
- **Wind tunnel** where students observe the aerodynamic properties of various shapes.

During the second part of the lab, students experiment with the design, construction and programming of a robot (based on LEGO components).

Circuits and Measurements Laboratory

The Circuits and Measurements laboratory is a new, state-of-the-art, teaching facility at the University of Cyprus.

◄ Experimenting in the Circuits and Measurements Laboratory

In this laboratory, students have the opportunity to get hands-on experience in laboratory experimentation and
hone their ability to validate models through experimentation in electrical and electronic circuit design, measurements and evaluation. The laboratory consists of 15 stations each equipped with a wide range of instruments, ranging from oscilloscopes to programmable function generators to power supplies and desktop computers. In addition, cutting edge instrumentation such as high frequency spectrum analyzers and arbitrary function generators are available for more complex projects.

**Digital Circuits and Systems Laboratory**

The laboratory of Digital Circuits and Systems was established in 2004 as a state-of the art teaching facility for digital logic design at the Department of Electrical and Computer Engineering.

This laboratory provides hands-on experience in designing and implementing digital logic circuits and systems. The laboratory experiments involve the design and testing of digital systems using small and medium scale integrated circuits. Students are exposed to engineering design with both discrete components and CPLD/FPGA based system boards. Computer-Aided Design tools and hardware description programming language (VHDL) are used extensively for design, simulation, and verification.

### 3.3 Best Student Awards

The IEEE Cyprus Section is sponsoring an award (£200) for the best first year student of the Department. For the 2003-2004 academic year, Minas Patsalides was the recipient of that honor, which was awarded at a special ceremony on 24/9/2004. The Electricity Authority Scientific Personnel Union is also sponsoring an achievement award (£100) which, for the 2003-2004 academic year, was awarded to Chrysovalantis Costa at the same ceremony. For the 2004-2005 academic year, the recipient of the IEEE Cyprus Section award was Christakis Christodoulou while the recipient of the Electricity Authority Workers Union Award was Minas Patsalides. Both awards were awarded during a special ceremony on 29/9/2005.

Minas Patsalides (left) and Chrysovalantis Costa (right) receiving their awards during the Sept. 2004 ceremony
3.4 Lego Robot Competition

During the “ECE 100 Introduction to Technology” course, students experiment with the design, construction and programming of a mobile robot (based on LEGO components). The students learn how to build simple robotic systems which are programmed to follow a desired path and to avoid obstacles. During the last two weeks of the lab, students participate in a robotic competition. The theme of the competition for the last two years was the “Robo-Pong” where two robots were engaged in a game of “ping-pong”. Each robot was designed to move autonomously and the objective was to throw as many ping-pong balls to the opponent’s side of the table as possible. The winner was the robot that had the least number of balls on its side at the end of the game. For 2003, the winning team of the competition was comprised of Chrysovalantis Costa, Chrystalla Ioannou and Anna Rouvi. For 2004, the winning team of the competition consisted of Elias Elia, Michael Ramp and Eleni Prokopi.
3.5 General Electives for the University of Cyprus Community

The ECE Department has developed two new courses that are offered as general free electives to the University of Cyprus community. The aim is to present technological advances and innovations in fields of broad interest in a manner understandable by all students, irrespective of their science background. These courses cover the fields of information technology and medical technology. The reception of the courses by the students has been enthusiastic. It is characteristic that all 45 available slots were filled during the first day of registration with as many more students filling the waiting list.

**ECE 001 – Health and Technology**

**Coordinator:** Constantinos Pitris  
**Objectives:** Provide basic knowledge on some of the technological innovations that are used in modern medicine.  
**Description:** Medicine has made tremendous progress since the beginning of the century. It has evolved from an art, when chances of survival were heavily stacked against the patient, to a science which saves lives every day. Medical technology, i.e. the inventions that put science to practical use, includes, among others, the discovery or invention and development of anesthesia, antiseptics, x-rays, blood transfusions, artificial and human organ transplants, and medical imaging techniques such as CT, MRI and ultrasound. This course examines the technological bases of some of the most important innovations in medical technology and analyzes the economic and ethical issues surrounding them. The course aims to enhance the understanding not only of the science, the machinery and the organization of modern medicine, but also of its origins, its social context, and its alternative futures. The course is intended for students of all majors without any specific science background.

**ECE 007 – Information Technology without Equations**

**Coordinator:** Christos Panayiotou, George E. Georgiou  
**Objectives:** Provide the basics of information technology and data communications to students from various disciplines without engineering or computer science background.  
**Description:** During the course, students learn the basic principles of the operation of high-tech devices such as mobile phones, palm pilots, etc. The course covers the information revolution and the unique product of the information age, the world wide web. Furthermore, it presents the basics of information representation as well as various forms of information such as audio, image and video. The course introduces aspects of data communication such as information transmission (wired, fiber-optic, radio and satellite), and data storage. The last part of the course describes how telephone and data networks work and presents basic concepts of information security. The course is intended for students of all majors without any specific science background.
### Postgraduate Program – August 2005

#### Demographics

<table>
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<tr>
<th>Gender</th>
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<tr>
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<td>Women</td>
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</table>

#### Undergraduate/Graduate Studies

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<th>Count</th>
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</thead>
<tbody>
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<td>Greece</td>
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<tr>
<td>UK</td>
<td>4</td>
</tr>
<tr>
<td>USA</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
</tbody>
</table>
4. Postgraduate Program

The period 2003-2005 was one of significant developments in the postgraduate program of the Department. The Ph.D. program in Electrical Engineering and the Ph.D. program in Computer Engineering were launched in the Fall of 2003. Seven high quality candidates were admitted in these programs and they have already become scientifically productive as evident by their high quality research output during the past two years. The following year, in the Fall of 2004, the Department began offering an M.Sc. degree in Electrical Engineering. That year, another seven Ph.D. and five M.Sc. students were admitted, further strengthening the postgraduate program. Preparations are also underway for the introduction of the M.Sc. degree in Computer Engineering in September 2005, thus completing the list of postgraduate degrees designated for the Department.

Some of the first postgraduate students of the Department. From left to right, Stelios Neophytou, Kyriakos Christou, Ioannis Socratous, Costas Constantinou, Michalis Markou.

4.1 Postgraduate Programs of Study

The Department admits new postgraduate students each year at the Masters and Doctoral levels. The number of new admissions fluctuates each year and depends on the needs of the Department and the quality of the candidates. Applications are submitted to the Department and are considered for evaluation by the Postgraduate Program Committee, which makes suggestions to the Department Council for final approval. Upon admission to the program, each student selects, by mutual agreement, one of the faculty members as his/her supervisor whom he/she should consult on academic and research issues. The Department offers four postgraduate degrees:

- M.Sc. in Electrical Engineering
- M.Sc. in Computer Engineering (to be offered September 2005)
- Ph.D. in Electrical Engineering
- Ph.D. in Computer Engineering
To obtain an M.Sc. degree a student must successfully

- Complete postgraduate level coursework (7 courses)
- Attend the graduate seminar series
- Submit a thesis proposal and progress report
- Pass the final defense of the Masters Thesis

A postgraduate student becomes a candidate for the Ph.D. degree after successfully passing the Ph.D. Qualifying Examination of the Department. For the fulfillment of a Doctor of Philosophy Degree the requirements are:

- Successfully complete postgraduate level coursework
- Attend the graduate seminar series
- Pass the Qualifying Examination
- Obtain approval of the Thesis Proposal submitted and presented by the student
- Complete at least one semester of Teaching Assistantship requirements
- Pass the final defense of the Thesis Dissertation

The postgraduate program began with the offering of courses listed in the following table. They cover areas such as telecommunications, intelligent systems and controls and computer engineering. The remaining of the areas of interest of the faculty was covered by a series of independent studies sections, which allowed the students to delve deeper into more specialized research topics.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Courses</th>
<th>Courses</th>
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<tbody>
<tr>
<td>ECE 621 Random Processes</td>
<td>ECE 658 Computer Systems Performance</td>
<td>Measurement and Evaluation</td>
</tr>
<tr>
<td>ECE 622 Information Theory</td>
<td>ECE 659 VLSI Design</td>
<td>ECE 660 VLSI Test</td>
</tr>
<tr>
<td>ECE 623 Digital Signal Processing</td>
<td>ECE 661 Logic Synthesis and Optimization</td>
<td>ECE 662 Physical Design Automation</td>
</tr>
<tr>
<td>ECE 624 Principles of Digital Communications</td>
<td>ECE 701-703 Postgraduate Seminar (Fall and Spring Semesters) I-III</td>
<td>ECE 711-712 Directed Study for Master Students (Fall and Spring Semesters) I-II</td>
</tr>
<tr>
<td>ECE 625 Wireless Communication Networks</td>
<td>ECE 721-722 Research and Writing Stage of M.Sc. Thesis (Fall and Spring Semesters) I-II</td>
<td>ECE 751-752 Directed Study for Ph.D. Students (Fall and Spring Semesters) I-II</td>
</tr>
<tr>
<td>ECE 626 Image Processing</td>
<td>ECE 761-764 Research Stage of Ph.D. Dissertation (Fall and Spring Semesters) I-IV</td>
<td>ECE 771-772 Writing Stage of Ph.D. Dissertation (Fall and Spring Semesters) I-II</td>
</tr>
<tr>
<td>ECE 631 Foundations of Systems Engineering</td>
<td>ECE 799 Special Topics in Electrical and Computer Engineering (Fall and Spring Semesters)</td>
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<tr>
<td>ECE 632 Modern Decision and Control Systems</td>
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</table>
Financial Support
Almost all full time Ph.D. students are financially supported through external research programs. In addition, the University of Cyprus supports many postgraduate students through teaching assistantships, the number of which depends on the needs of the Department. There are also some additional funding opportunities, information on which may be available through the Office of Student Affairs.

4.2 Postgraduate Student Research
Postgraduate students are an integral part of the Department’s research activities. Many projects are in the hands of postgraduate students who are being groomed to become leaders in the scientific arena of new discoveries. As part of their research activities postgraduate students often present their work at local and international conferences and fora.

Student Presentations at International Conferences

Doctoral student Panos Ioannides (third from left) presented his work on “Wavelet Decomposition and Unresolvable Component Analysis of Optical Coherence Tomography Signals” at the European Conference on Biomedical Optics, Munich, Germany, June 14-16, 2005. Here he is enjoying a beer with Prof. James G. Fujimoto (MIT), Dr. Costas Pitris (U. of Cyprus) and Dr. Stephen Boppart (U. of Illinois, Urbana-Champaign).
Student Presentations at Local Seminars


4.3 Postgraduate/Research Laboratories

The success of the ECE Department depends, to a large extend on the development of high quality postgraduate programs. The Department has invested in two new research laboratories which will provide the environment for successful postgraduate training. The two laboratories are

- Telecommunications and Networks Laboratory
- Biomedical Imaging and Applied Optics Laboratory

These two laboratories accommodate the research work of several faculty and Ph.D. students. The success of these two laboratories is evident from the large number of publications which have originated from the research performed. They have also been a vehicle for attracting several research grants.

Telecommunications and Networks Laboratory

Starting Date: Fall 2003

Members: Charalambos D. Charalambous, Associate Professor
Christos Panayiotou, Assistant Professor
Georgios Ellinas, Assistant Professor
Stavros Toumpis, Lecturer

Description:

Telecommunications and information technology products have over the last few years, manifest themselves into forces, which drive the economic expansion of many developed countries. As a consequence, many countries around the world invest a significant portion of their generated revenues in research and development programs, which are directly or indirectly related to telecommunication and information technology systems.

Telecommunications and Networks Laboratory

The objective of the Telecommunications and Networks Laboratory is to support the research and teaching needs of the faculty members of the Department of Electrical and Computer Engineering, in the areas of wireless communications, multimedia networking, network modeling and performance analysis, networking technologies, fiber-optic communications, middleware for applications with real-time requirements, video technologies and telecommunication hardware devices.

In more recent years, several telecommunications and networking developments have emerged to dramatically alter the existing telecommunication infrastructure. The emergence of wireless
communications, fiber-optic and ad-hoc sensor networks are a few examples of the dramatic rise and impact of telecommunications in today’s society. The Department and its faculty, realizing the importance of telecommunications, has created the Telecommunications and Networks laboratory, which will serve the teaching needs of our Department in providing undergraduate and postgraduate students with the basic knowledge and education in telecommunications, including wired and wireless technologies and networks. The long term objective of the Telecommunications and Networks laboratory is the establishment of a close collaboration with the industry, via the solicitation of a number of industrial funded research projects. Through these projects, the undergraduate and postgraduate students of the Department will be exposed to the industry needs, and they will become aware of the structure and operation of the telecommunications industry. The Telecommunications and Networks laboratory also aims at providing the necessary infrastructure for cutting-edge research in the communications and networking area, by enabling our Department members to become involve in multi-disciplinary research at the national and international arena.

Biomedical Imaging and Applied Optics (BIAO) Laboratory

Starting Date: January 2004
Members: Constantinos Pitris, Lecturer
Description: The objective of the Biomedical Imaging & Applied Optics Laboratory is to bridge the gap between science and medicine and explore the development of new optical and other imaging technologies and their applications in clinical situations.

Techniques such as confocal microscopy, OCT, two-photon microscopy, and high frequency ultrasound have shown great promise over the years. They are, however, still in their infancy and require further development and integration with current medical practice. This area has the potential to significantly improve the diagnostic and therapeutic options of modern health care systems and directly impact patient prognosis and outcome. The BIAO Laboratory strives to integrate the identification of diagnostic challenges, development of new diagnostic technologies, clinical validation and human studies and transfer to industry. Current interests include the implementation of diagnostic technologies for the early detection of pre-malignant and cancerous lesions of the skin and the gynecological and gastrointestinal tracts which are characterized by either high or rising incidence in Cyprus. Expertise in engineering, science and medicine as well as strong ties to the local and international scientific and medical community play an integral role in reinforcing and augmenting the scientific potential of the group. The laboratory also aims to foster an educational environment that promotes independent and creative thinking in a multi-disciplinary environment for both undergraduate and postgraduate students and to prepare them for a successful career in science or medicine with more relevance to real life problems.
### Research Activities, Sept. 2003-Aug. 2005

<table>
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<th>Publications</th>
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<table>
<thead>
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<th>Research Grants</th>
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</thead>
<tbody>
<tr>
<td>Number of Research Projects</td>
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</tr>
<tr>
<td>Research Funding (Euros)</td>
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<td>Percentage of External Funding</td>
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<table>
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<tbody>
<tr>
<td><strong>Total</strong></td>
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</table>
5. Research

Research plays a central role in the activities of the Electrical and Computer Engineering Department at the University of Cyprus. Despite the relatively small number of faculty and the fact that the Department is still at an early stage in its development, we have the vision of creating an inspiring and productive environment, where high quality theoretical and applied research can be carried out. Since this biennial report covers the first two years of admitting postgraduate students, most of the research activity was the result of the new faculty’s continuing research from their previous institutions. The Department has achieved some notable research distinctions during the period Sept. 2003 – Aug. 2005. Specifically, there were 140 refereed publications, which correspond to 7 publications per faculty per year. Of these publications, 41 were journal publications in some of the most prestigious journals in the field (e.g. SIAM Journal on Control and Optimization, IEEE/ACM Transactions on Networking, IEEE Transactions on Computer-Aided Design (CAD) on Integrated Circuits and Systems, Cancer, IEEE Transactions on Automatic Control, IEEE Transactions of Power Systems, AIAA Journal of Guidance, Control and Dynamics, Annals of Operations Research, International Journal of Adaptive Control and Signal Processing, IEEE/OSA Journal of Lightwave Technology, IEEE Journal of Solid State Circuits).

The ECE Department was successful in attracting significant research funding. Specifically, the faculty in the Department were awarded 16 research projects, totaling more than 1,250,000 Euros (715,827 Cyprus Pounds). It is important to note that about 80% of this research funding was from external sources, while the remaining 20% was from internal, competitive, University of Cyprus research programs. The high quality and visibility of the research program that is being carried out in the ECE Department, is evident by the prestigious positions that ECE faculty members hold, such as Editor-in-Chief of the IEEE Transactions on Neural Networks, Associate Editor of the IEEE Transactions on Automatic Control, Chair of the IEEE CSS Technical Committee on Intelligent Control, Vice President for Conferences of the IEEE Computational Intelligence Society, Members of International Program Committees for several conferences, etc.

5.1 Publications

Chapters in Edited Books
Refereed Journal Papers


Other Journal Publications


Refereed Conference Proceedings


69. C. Chrysostomou, A. Pitsillides, G. Hadjipollas, M. Polycarpou and A. Sekercioglu, “Fuzzy Logic based Congestion Control in TCP/IP Networks for Quality of Service Provisioning,” Proceedings of


**Patents Issued**


5.2 Research Grants

The following is a list of research and educational grants that were active during part (or all) of the period Sept 2003 – Aug 2005. The listing is in alphabetical order with respect to the name of the principal investigator. The list includes only grants where the principal investigator is a faculty member in the Electrical and Computer Engineering Department; there are several other grants not listed where ECE faculty contributed as co-investigators. It is noted that 5 of the 10 ECE faculty started their appointment in 2005, therefore their research activities in terms of research funding will be reported in the next biennial report of the Electrical and Computer Engineering Department. The conversion rate between Cyprus Pounds (£) and Euros is the same for all grants: £1.00 = 1.75 Euros.

1. **Title:** Convergence of Communication, Control, and Statistical Mechanics with Applications to Network Sensors and Tele-Operation  
   **Principal Investigator Name:**  
   Charalambos Charalambous, University of Cyprus  
   **Co-Investigators Names:**  
   Andreas Kyprianou, University of Cyprus  
   Stavros Kassinos, University of Cyprus  
   Nasir Ahmed, University of Ottawa, Canada  
   Alireza Farhadi, University of Ottawa, Canada  
   Farrokh J. Sharifi, Ryerson Polytechnic University, Canada  
   Seddik Djouri, University of Tennessee, USA  
   **Period:** 1/7/2004-31/6/2007  
   **Amount:** £75,000 (131,250 euros)  
   **Funding Agency:** University of Cyprus Research Fund  
   **Description:** This project consists of a theoretical part and an experimental part. The theoretical part deals with large scale complex systems, in which the traditional areas of Communication, Control, and Statistical Mechanics are converging, while being subject to uncertainty, capacity and power constraints. The experimental part is concerned with the application of the theoretical work in sensor networks, control over wireless links, and tele-operation systems, in which the theoretical results and algorithms will be tested and evaluated.

2. **Title:** Robust Information Transmission and Control Subject to Uncertainty and Power Constraints  
   **Principal Investigator Name:**  
   Charalambos Charalambous, University of Cyprus  
   **Co-Investigators Names:**  
   Marios Polycarpou, University of Cyprus  
   Christos Panayiotou, University of Cyprus  
   **Period:** 1/7/2004-31/6/2006  
   **Amount:** 80,000 euros (£46,714)  
   **Funding Agency:** European Commission, Marie Curie Programme  
   **Description:** The rise of internet technologies and standards has created a rapid convergence between computing and communications, in which computers are becoming pervasive technology. On the other hand, recent advances in wireless communications and electronics has enabled the development of new low cost, low power multifunctional sensors, which communicate over small distances. This project focuses on the creation of a unified framework of robust information transmission in which Shannon’s information theory, such as source coding, data compression, channel coding, channel capacity blocks are subject to uncertainty.
3. **Title:** Development of Cross-Layer Algorithm for Optimization of Power Consumption in Wireless Networks via Directed Antennas  

**Principal Investigator Names:**  
Charalampos Charalambous, University of Cyprus  
Leandros Tassiulas, University of Thessaly, Greece  

**Co-Investigators Names:**  
Marios Polycarpou, University of Cyprus  
Athanasios Korakes, University of Thessaly, Greece  

**Period:** 1/6/004-31/5/2006  
**Amount:** £9,900 (17,325 euros)  
**Funding Agency:** Research Promotion Foundation, Cyprus  
**Description:** This project is concerned with optimal power consumption in wireless networks while meeting the required Quality of Service (QoS). New unified cross-layer algorithms will be developed and using directed array antennas. The algorithms will combine Physical Layer, MAC Layer and Network Layer characteristics.

4. **Title:** Wireless Channel Simulator Based on Measurement Data and its Applications to Cellular Networks  

**Principal Investigator Name:**  
Charalampos Charalambous, University of Cyprus  

**Co-Investigators Names:**  
Robert Bultitude, Canadian Communications Research Center, Canada  
Andreas Siamarou, Intercollege, Cyprus  

**Period:** 1/6/2004-31/5/2006  
**Amount:** £33,955 (59,421 euros)  
**Funding Agency:** Research Promotion Foundation, Cyprus  
**Description:** The theoretical objective of this proposal is to create universal models capturing the time-varying multi-path statistical properties of wireless fading channels, from measurement data, which are robust with respect to diverse origin of measurements (e.g., collected in different regions around the world). The practical objective is to design a web based information technology software simulator stationed in Cyprus, through which scientists who have access to measurement data will be able to connect, input their data, extract mathematical models, and employ the models to test telecommunication products. The web based software package will be accessible by anyone and from anywhere around the world.

5. **Title:** Development and Deployment of Location Based Services in Wireless Networks  

**Principal Investigator Names:**  
Charalampos Charalambous, University of Cyprus  
Christos Panayiotou, University of Cyprus  

**Co-Investigators Name:**  
Marios Polycarpou, University of Cyprus  

**Period:** 1/9/2003 – 31/12/2003  
**Amount:** £22,000 (38,500 euros)  
**Funding Agency:** University of Cyprus, Applied Research Fund  
**Description:** Access of the right information “anytime, anywhere” is becoming the new driving force that drives the information technology revolution. The “right” information is information that is relevant based on the user’s profile and his/her current position and/or time. Such services will contribute in improving individual and public safety (e.g., report the position of a casualty or of a fire). They will also facilitate effective information dissemination and enable individual or asset tracking. The benefits of such services will be immediately obvious to a number of industries as well
as visible to many individuals. This project aims at developing the technologies that will allow wide deployment of location based services. Specifically, during this project we investigated various Automatic Location Identification (ALI) techniques (ALI techniques utilize the received signals at a mobile terminal to estimate the location of the user).

6. **Title:** ESTIA-Net: Opening up Electrical Engineering, Computer Technologies and Applied Sciences to Successful Women Careers

**Principal Investigator Name:**

Maria G. Ioannidis, National Technical University of Athens, Greece

**UCY Principal Investigator Name:**

Maria K. Michael, University of Cyprus

**UCY Co-Investigator Name:**

Marios M. Polycarpou, University of Cyprus

**Period:** 1/10/2003-1/10/2004

**Amount:** £223,408 (390,964 euros) (total)

[Note: UCY is one of several nodes which are part of the ESTIA network. The amount listed is the total for all the nodes (no specific allocation was made)]

**Funding Agency:** EC Socrates/Erasmus 3 Thematic Network

**Description:** The main objective of ESTIA-Net is to build up a thematic network, focused in creating women-friendly interdisciplinary postgraduate education in Electrical Engineering, Computer Technologies and Applied Sciences. The network aims at increasing awareness about gender bias issues in education, informing and motivating young women, leading women to their educational and career paths, and studying the potentials for implementing a new interdisciplinary postgraduate curriculum. ESTIA-Net mainly targets female students, young women deciding their future education and career, women executives who need postgraduate education on new technologies, and women who start a new career. Main activities include research into the number of women students and academic staff in Universities, development of a mentor’s curriculum, organization of a mentor’s seminars and info days, identification of existing interdisciplinary courses and assessment of their impact, implementation of a Web site and an information system for perspective students, design of the interdisciplinary postgraduate women-friendly curriculum and dissemination.

7. **Title:** Automated Path Delay Test for VLSI circuits using Non-Enumerative Methods

**Principal Investigator Name:**

Maria K. Michael, University of Cyprus

**Co-Investigators Name:**

Spyros Tragoudas, Southern Illinois University, USA

**Period:** 1/6/2004-31/5/2005

**Amount:** £13,200 (23,100 euros)

**Funding Agency:** Research Promotion Foundation, Cyprus

**Description:** This project aims to the development of a new Test Pattern Generation (TPG) method that can be utilized for pre-fabricated and post-fabricated timing verification in ULSI/VLSI circuits. The currently most comprehensive and accurate delay fault model for detecting incorrect timing behavior, the Path-Delay Fault (PDF) model, is considered. The challenging task of handing the huge number of faults per circuit (the number of PDFs is exponential to the circuit size, in the worst case) is addressed. This TPG is the core, based on which a uniform function-based framework for timing verification and delay fault test will be developed in the future. The development of such an accurate and efficient TPG will enable the investigation of other central problems in this area such as test set compaction for various optimization criteria and path sensitization which, in turn, can improve the performance of the TPG.
8. **Title:** ECOPLACE: Electrical and Computer Engineering Student Placements in Europe  

**UCY Principal Investigator Name:**  
Mrs Emma Zeniou, International Relations and European Programs  
**ECE Principal Investigator Name:**  
Maria Michael  
**Period:** 2006 Academic Year  
**Amount:** £11,446 (20,030 euro)  
**Funding Agency:** EU Leonardo da Vinci, Community Vocational Training Action Program  
**Description:** This is a vocational training project which is part of the EU’s Leonardo da Vinci program. It will promote and fund the placement of four students per year, during the summer period (June-August), in companies in Austria and Germany. The collaborators in this effort are the Danube Association for European Training and RTD in Austria and the Leonardo Office Part Sachsen at the Technical University of Dresden in Germany.

9. **Title:** Enabling Technologies for Location Based Services (LBS)  

**Principal Investigator Name:**  
Christos Panayiotou, University of Cyprus  
**Co-Investigators Name:**  
Charalambos Charalambous, University of Cyprus  
Marios Polycarpou, University of Cyprus  
**Period:** 1/7/2004-30/6/2007  
**Amount:** £50,000 (87,500 euros)  
**Funding Agency:** Research Promotion Foundation, Cyprus  
**Description:** This project is a continuation to the “Development and Deployment of Location Based Services in Wireless Networks”. It involves collaboration between the University of Cyprus and the Cyprus Telecommunication Authority (CYTA) and consists of two main parts. The first part is concerned with the investigation of technologies that improve the accuracy of automatic location identification estimates. We shall investigate the existing methods and will seek to improve their accuracy using intelligent systems as well as derive new approaches based on stochastic modeling and analysis. The second part involves the development and deployment of pilot location based services (LBS) which will allow service providers to disseminate information based on the subscriber’s location. It is anticipated that this project will have significant socioeconomic benefits for Cyprus. These range from improving public safety to stimulating new product and service development.

10. **Title:** Development of a Framework for Quality of Service Provisioning in Communication Networks  

**Principal Investigator Name:**  
Christos Panayiotou, University of Cyprus  
**Co-Investigators Name:**  
Charalambos Charalambous, University of Cyprus  
Marios Polycarpou, University of Cyprus  
**Period:** 1/6/2004-31/5/2005  
**Amount:** £13,200 (23,100 euros)  
**Funding Agency:** Research Promotion Foundation, Cyprus  
**Description:** This project focuses on the development of a general framework for performing real-time resource allocation for network management and control functions in the context of wired and wireless networks. The framework that is proposed for this research is a hybrid modeling paradigm based on Stochastic Fluid Models (SFM), which have recently been shown to be especially useful for analyzing various kinds of high-speed networks. Using this modeling framework a new approach for network management is proposed which is based on Infinitesimal Perturbation Analysis (IPA).
This approach is computationally efficient; It is based on estimating the gradient of the performance measure of interest (e.g., packet loss rate) with respect to control parameters (e.g., buffer thresholds) and subsequently employ them in standard stochastic approximation algorithms to determine the optimal parameter setting.

11. **Title:** Quality of Service Provisioning for Real-Time Applications  
**Principal Investigator Name:**  
Christos Panayiotou, University of Cyprus  
**Co-Investigators Name:**  
Christos Cassandras, Boston University  
Charalampos Charalambous, University of Cyprus  
Marios Polycarpou, University of Cyprus  
Andreas Pitsillides, University of Cyprus  
**Period:** 1/6/2005-31/5/2008  
**Amount:** £39,946 (69,906 euros)  
**Funding Agency:** Research Promotion Foundation, Cyprus  
**Description:** Emerging computer applications such as multimedia, video streaming etc have high and stringent requirements (bandwidth and buffer). This project focuses on new approaches for performing resource allocation in wired and wireless networks in order to enable them to support real-time applications. The investigated approaches are based on the principles of Infinitesimal Perturbation Analysis (IPA).

12. **Title:** High Frequency Ultrasound Spectral Imaging of Congenital Multiple and Large Nevi  
**Principal Investigator Name:**  
Constantinos Pitris  
**Co-Investigators Names:**  
Marios Polycarpou, University of Cyprus  
Charalampos Charalambous, University of Cyprus  
Georgia Koulermou, Makarios Hospital, Cyprus  
Chrysostomos Yallouros, Makarios Hospital, Cyprus  
Michael Averkiou, ATL Ultrasound, USA  
**Period:** 14/9/2004-14/9/2007  
**Amount:** £72,400 (126,700 euros)  
**Funding Agency:** Research Promotion Foundation, Cyprus  
**Description:** Although melanoma, a malignant skin tumor, is the least common skin cancer, it is by far the most deadly. A large percentage of malignant and metastatic melanomas have their origins in benign melanocytic lesions, such as nevi, which have not been diagnosed at an early stage. Currently, the diagnosis of dysplasia is based on histopathologic processing of tissue from excised atypical nevi or biopsies of large nevi. In patients with multiple or large nevi, excision and frequent biopsies are not possible so the decision to proceed with the procedure is mainly based on the visual inspection of the lesions for signs of atypia and the experience of the clinician. The objective of this project is to develop, test and validate a prototype system able to support the physician in the analysis of melanotic skin lesions. High frequency ultrasound offers a noninvasive means of examining cutaneous lesions with relatively high resolution.

13. **Title:** Development of Advanced Karyotyping Technology  
**Principal Investigator Name:**  
Constantinos Pitris, University of Cyprus  
**Co-Investigators Name:**  
Phillipos Patsallis, Cyprus Institute of Neurology and Genetics, Cyprus  
**Period:** 1/12/2003-1/4/2004  
**Amount:** 18,000 CYP (31,500 euros)
**Funding Agency:** University of Cyprus, Applied Research Fund  
**Description:** Human chromosome analysis is an essential task in cytogenetics, especially in prenatal screening, genetic syndrome diagnosis, cancer pathology research and mutagen dosimetry. Both manual and automatic classification of chromosomes are limited by the resolution of the microscope and imaging system used. One way to improve the results of classification and even detect subtleties now remaining undetected, is to enhance the resolution and quality of the chromosome images. It is possible to achieve lateral resolution, well beyond the classical limit, by using spatially modulated illumination (SMI) in a wide-field, non-confocal microscope. In this method, the sample is illuminated with spatially modulated light, which makes normally inaccessible high-resolution information visible in the observed image by shifting higher frequencies within the OTF limits of the microscope.

14. **Title:** Intelligent Computer Control of Water Systems in Cyprus  
**Principal Investigator Name:**  
Marios Polycarpou, University of Cyprus  
**Co-Investigators Name:**  
Andreas Manoli, Water Development Department, Cyprus  
**Period:** 1/8/2004-31/7/2006  
**Amount:** £30,000 (52,500 euros)  
**Funding Agency:** University of Cyprus Research Fund  
**Description:** This project aims to develop and simulate methods for automatic feedback control of both quantity and quality dynamics in water distribution networks. The hydraulic control objective is considered in terms of water pressures at point of consumption, while the quality control objective focuses on the regulation of chlorine residual at points of consumption. The proposed approach is based on approximating the input/output dynamic behavior and transport delay of chlorine concentration between an injection node (input) and a monitored node (output) as a time-varying, discrete-time linear model with unknown coefficients, which are estimated on-line and used for feedback control.

15. **Title:** Fault Diagnosis in Stochastic Dynamical Systems with Censorship, Involving Neural Models.  
**Principal Investigator Name:**  
Pedro J. Zufiria, Universidad Politécnica de Madrid, Spain  
**UCY Principal Investigator Name:**  
Marios M. Polycarpou, University of Cyprus  
**Period:** 1/12/2003-1/12/2004  
**Amount:** £22,658 (39,651 euros) (total)  
**Funding Agency:** Ministry of Science and Technology of Spain  
**Description:** The design of a fault diagnosis scheme for nonlinear dynamical systems with structural uncertainty and perturbations is proposed, so that the model considers stochasticity and data censorship. Initially, a plant identification is performed via neural models, taking into account the data censorship. Afterwards, the detection schemes will be performed based on decision theory, in the framework of stochastic differential and difference equations. Non-censored data will be assumed in a first step; then, the design of observers and identifiers will take into account censorship. Finally, faults (both deterministic and stochastic) will be identified with neural models for accommodation purposes. The resulting schemes will be evaluated in different simulation practical cases. The feasibility of experimental evaluations in a mobile robot will also be addressed.

16. **Title:** The incorporation of the “inverter” in the design of vehicle suspension systems  
**Principal Investigator Name:**  
Marios Polycarpou, University of Cyprus  
**Co-Investigators Name:**
Malcolm C. Smith, Cambridge University, U.K.

**Period:** 1/1/2005-31/12/2006  
**Amount:** £35,000 (61,250 euros)  
**Funding Agency:** University of Cyprus Research Fund  
**Description:** The objective of this project is the utilization of a new mechanical element, the “inerter”, in the design of vehicle suspensions. The ideal inerter is a recently invented, two-terminal, passive, mechanical element that has the characteristic that the relative acceleration between its terminals is proportional to the force applied through it. The use of inerters along with springs and dampers allows the realization of any positive real admittance as a passive mechanical network. The basic goals of the project include the development of suspension design methods involving optimization over the class of positive real admittances (which can be realized with passive mechanical networks) that will minimize certain performance measures related to desirable properties of vehicle suspensions such as ride comfort, tire grip and ability of the suspension to reject external loads.

### 5.3 Professional and Educational Service Activities

**Editorial activities**

1. **Charalambos Charalambous** served as Associate Editor of the *IEEE Transactions on Automatic Control* (12/2002-12/2004).
2. **Christos Panayiotou** serves as a Member of the Conference Editorial Board of the IEEE Control Systems Society (6/2001-present).
3. **Marios Polycarpou** is the Editor-in-Chief of the *IEEE Transactions on Neural Networks* (January 2004 – present).
4. **Marios Polycarpou** served as Associate Editor of the *IEEE Transactions on Neural Networks* (1/1998-12/2003).
5. **Marios Polycarpou** serves as Associate Editor of the *International Journal of Applied Mathematics and Computer Science* (1/2002-present).

**Conference Organization Activities**

1. **Charalambos Charalambous** served on the Program Committee of the 2004 IEEE Conference on Decision and Control, December 2004.
3. **Charalambos Charalambous** served as the Registration Chair for the IEEE International Symposium on Intelligent Control (ISIC 05) and the Mediterranean Conference on Control and Automation (MED 05), June 2005.
4. **Charalambos Charalambous** served on the Program Committee of the Workshop for the 65th Birthday of Prof. Robert J. Elliott on Stochastic Calculus and its Applications to Quantitative Finance and Electrical Engineering, July 2005.
5. **Georgios Ellinas** served as a member of the Technical Program Committee for the IEEE Global Telecommunications Conference (GLOBECOM), 2005.
6. **Georgios Ellinas** served as the Optical Networking Subcommittee Chair for IEEE/OSA Optical Fiber Communications Conference (OFC), 2004.
7. **Georgios Ellinas** served as a member of the Technical Program Committee for the Laser Electro-Optic Society Annual Meeting (LEOS), 2004.
8. **Georgios Ellinas** served as a member of the Technical Program Committee for the Laser Electro-Optic Society Annual Meeting (LEOS), 2005.

10. **Georgios Ellinas** served as a member of the Technical Program Committee for the Asia Pacific Optical Communications Conference (APOC), 2003.

11. **Julius Georgiou** served as a member of the BioCAS Technical Program Committee of the 2004 IEEE International Symposium on Circuits and Systems (ISCAS), May 2004, Vancouver, Canada

12. **Julius Georgiou** served as a member of the Analog Signal Processing Technical committee of the 2004 IEEE International Symposium on Circuits and Systems (ISCAS), May 2004, Vancouver, Canada

13. **Julius Georgiou** served as a member of the BioCAS Technical Program Committee of the 2005 IEEE International Symposium on Circuits and Systems (ISCAS), May 2005, Kobe, Japan

14. **Julius Georgiou** served as a member of the Analog Signal Processing Technical committee of the 2005 IEEE International Symposium on Circuits and Systems (ISCAS), May 2005, Kobe, Japan

15. **Maria K. Michael** co-organized the special pre-Conference Workshop “Encouraging Young Women towards Engineering and Applied Sciences”, for the joint IEEE International Symposium on Intelligent Control (ISIC 05) and Mediterranean Conference on Control and Automation (MED 05), June 2005.

16. **Christos Panayiotou** served as a member of the Program Committee for the 43rd IEEE Conference on Decision and Control. (CDC 04)

17. **Christos Panayiotou** served as the Finance and Local Arrangements Chair for the IEEE International Symposium on Intelligent Control (ISIC 05) and the Mediterranean Conference on Control and Automation (MED 05).


20. **Christos Panayiotou** is a member of the Technical Program Committee of the 2006 IEEE International Conference on Robotics and Automation.

21. **Constantinos Pitris** served as a member of the Program Committee for the European Conference On Biomedical Optics 2005 (ECBO 05).

22. **Marios Polycarpou** served as the General Chair for the IEEE International Symposium on Intelligent Control (ISIC 05) and the Mediterranean Conference on Control and Automation (MED 05).

23. **Marios Polycarpou** served as Vice President for Conferences, of the IEEE Computational Intelligence Society (formerly Neural Networks Society) (01/2002–12/2003).

24. **Marios Polycarpou** serves as the Chair of the Technical Committee on Intelligent Control, IEEE Control Systems Society (06/2003-present).


27. **Marios Polycarpou** served as a member of the Program Committee for the IEEE International Symposium on Intelligent Control (ISIC 2004), August 2004, Taipei, Taiwan.

28. **Marios Polycarpou** served as a member of the International Program Committee for the IASTED International Conference on Modeling, Identification, and Control (MIC 2005), February 16-18, 2005, Innsbruck, Austria.

29. **Marios Polycarpou** served as a member of the International Program Committee for the 2nd International Conference on Informatics in Control, Automation and Robotics (ICINCO 2005), Barcelona, Spain, 2005.
30. **Marios Polycarpou** served as a member of the International Program Committee for the 5th International Conference on Technology and Automation (ICTA’05), Thessaloniki, Greece, 2005.


32. **Stavros Toumpis** serves as the Publicity Chair for WiOpt 2006.


**Other Professional Service Activities**

1. **Charalambos Charalambous** serves as the ESF National Contact Point for Program MINEMA (Middleware for Network Eccentric and Mobile Applications) (9/2003-Present.)

2. **Charalambos Charalambous** serves as a Research Proposal Reviewer for the Natural Science and Engineering Research Council of Canada (since 2000) and the Australian Research Council (since 2002)

3. **George Ellinas** is a research project evaluator for the National Science Foundation (NSF) (Optical Networking Panel)

4. **Maria Michael**, was appointed member of the International Steering Committee of ESTIA-Net.

5. **Christos Panayiotou** serves in the Executive Committee of the IEEE Cyprus Section responsible for student activities.

6. **Constantinos Pitris** served as the EU Framework Program 6, National Contact Point for Thematic Priority 3 – Nanotechnology, Manufacturing and Production (9/2003-9/2004.)

7. **Constantinos Pitris** serves as a reviewer for the European Commission, DG Research & International Science and Technology Center (ISTC), September 2004 – present.

8. **Marios Polycarpou** serves as a member of the faculty evaluation committee for promotion and tenure for Intercollege, 2002-present.

9. **Marios Polycarpou** serves as a member of the evaluation committee for degree certification in Cyprus (KYSATS), 2005 – present

10. **Stavros Toumpis** is a research project evaluator for Research Council of Norway (VERDIKT program).

**5.4 International Conference Organization in Cyprus**

The Department of Electrical and Computer Engineering organized between 26-29 June 2005 two international conferences: the 20th IEEE International Symposium on Intelligent Control (ISIC ‘05) and the 13th Mediterranean Conference on Control and Automation (MED ‘05). Both conferences were organized jointly at the Hawaii Grand Hotel in Limassol, Cyprus. The main objective of both conferences was to bring together in a beautiful and inspiring environment researchers and practitioners from different countries to discuss the state-of-the-art and present new theoretical developments as well as address new and emerging approaches and applications in areas such as automation, intelligent systems, telecommunications and networks, nanotechnology, etc. The conference was very successful, having attracted more than 250 participants from 45 different countries. The participants enjoyed not only the technical program of the conference, but also the Cyprus hospitality and entertainment. The technical program of the conferences included 282 presentations, which were selected after evaluation of the 399 papers that were submitted. The presented research works were collected in the conference proceedings in the form of a CD-ROM, which was also posted on IEEE-Xplore.

Within the framework of the joint conference, several activities were also organized such the Workshop on “Encouraging Young Women towards Engineering and Applied Sciences” (see the OUTREACH section) and a Plenary Panel by experts on the Early History of Autonomous Mechanisms, and the role that the Mediterranean countries played in the development of technology in ancient times. The joint conference banquet, organized in the main plaza of the Omodhos village, was a big success.
The reception of the ISIC05/MED05 conference was held, with great success, at Omodhos.

Postgraduate and undergraduate students of the Electrical and Computer Engineering Department volunteered for all the activities of the conference and had the opportunity to meet well known professors and researchers from various countries. The conference and the workshop were sponsored by the Electricity Authority of Cyprus (EAC), the Cyprus Telecommunication Authority (CyTA) and the University of Cyprus.

5.5 Colloquia and Seminars

With the admission of the first postgraduate students in September 2003, the Department of Electrical and Computer Engineering initiated the ECE Seminar Series. Prominent speakers from Cyprus and abroad presented their research work during the ECE Seminar Series. The seminars were attended by the ECE postgraduate students and faculty as well as faculty and students of other departments. Moreover, the seminars were open to the public and some of them were attended by engineers from the local industry and government organizations. The ECE Seminar Series provided an excellent forum for discussion of current issues, for initiation of collaboration with industry, and in general for meeting other people of similar research interests. A list of speakers for the ECE Seminar Series for the period September 2003 – August 2005 is given below.

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<td>6/04/2005</td>
<td>Stavros Iezekiel University of Leeds, UK</td>
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<td>Andreas Pitsillides University of Cyprus</td>
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<td>Richard Morrow University of Sydney, Australia</td>
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6. Outreach

In addition to teaching and research, the Electrical and Computer Engineering Department has initiated various outreach efforts with the local industry and other organizations. The objective of these outreach efforts is fivefold: (1) to make the community aware of the presence of the new department; (2) to establish collaborations with the local industry; (3) to promote the Department and the University of Cyprus as a favorite destination for Cypriot students who want to excel in their fields; (4) to educate the public on technological issues that are of current interest and that affect the quality of life of the local population; and (5) to contribute to the government efforts of enhancing the competitiveness of the Cyprus economy in high-technology enterprises.

One of the key accomplishments in our outreach effort was the publication of a newsletter and a Department brochure that is distributed to all local high schools and other organizations. Other outreach activities include the Department’s leading participation in the University of Cyprus bilateral agreement with the Electricity Authority of Cyprus, and the organization of open days and workshops that focused on attracting high quality high school students to the Department. The Department, in collaboration with the Cyprus Ministry of Education and Culture and the Department of Electrical and Computer Engineering of the California State University in Los Angeles, has also organized an all-day workshop that had as a goal the encouragement of young women towards engineering and applied sciences. Additional outreach activities include the initiation of collaboration meetings with several companies and organizations, including the Cyprus Telecommunication Authority, HellasSat, the Cyprus Scientific and Technical Chamber, etc.

ECE faculty members have participated in evaluation committees of local colleges, they have served as consultants in local business incubator efforts and they have initiated entrepreneurship activities. Notably, two of our faculty (Christos Panayiotou and Constantinos Pitris) were part of teams that won the First Prize at the 1st and 2nd Cyprus Entrepreneurial Competitions respectively, in December 2003 and July 2005.

6.1 Bilateral Agreement with the Electricity Authority of Cyprus (EAC)

The Department in an effort to initiate extensive and meaningful collaboration with the local industry has spearheaded a bilateral agreement between the University of Cyprus and the Electricity Authority of Cyprus. The goal of this agreement is threefold: (1) to establish close collaboration ties between the EAC and the ECE Department, (2) to enhance the research and development activities of both parties, and (3) to utilize the experiences of both organizations towards the advancement of cutting-edge technology which will in turn enhance Cyprus’ economy.

The bilateral agreement includes the following areas of collaboration:

- Submission of common research proposals.
- Co-authoring of journal and conference papers.
- M.Sc. or Ph.D. thesis work on technical issues of interest to EAC.
- Exchange of technical information and data.
- Usage of the EAC technical laboratories by the ECE personnel and vice versa for experimental purposes.
- Scholarships to the EAC personnel to pursue M.Sc. or Ph.D. degrees in areas of interest to EAC.
- Organization of technical seminars by the ECE faculty for the EAC personnel.
- Summer internships for the Department’s students at the EAC facilities.
- Consulting services by the ECE personnel to EAC for areas that affect the quality of life of the local population.
6.2 Newsletter Publication

In an effort to communicate more effectively with its students and colleagues but also increase public awareness of the Department’s work, ECE has begun publishing a newsletter at the end of each semester. The publication has been named “Ψηλές Συχνότητες” (High Frequencies), a name with connotations as to the level of operations that the Department strives to maintain. In the first four issues, a number of articles appeared that detail academic and research news, student issues and awards or honors bestowed on the Department and its people. Editorials on the role of women in engineering, the liberalization of the telecommunications market, electromagnetics and safety and nanotechnology have also appeared.

Covers of the first four issues of the ECE Department Newsletter
6.3 Electrical and Computer Engineering Open Day

The ECE Department has organized an open day on December 1, 2003, whose purpose was the introduction of the programs of study and the faculty to those interested in studying at the Department and to the general public. The event began with a presentation of the activities of the Department’s first ever semester of operations, followed by a discussion on the future and prospects of a career in Electrical and Computer Engineering. The second part of the event was an introduction of the postgraduate programs of study including the Masters program which started in the Fall semester of 2003. The presentations were followed by a lively question-answer session, where the audience had the opportunity to inquire into any aspects of the program that were not clear. The event ended with a small reception in the lobby of the University’s main hall.

The speakers and public at the ECE Open Day on December 1, 2003.

6.4 “Encouraging Young Women Towards Engineering and Applied Sciences”, ISIC and MED 2005, Special Pre-Conference Workshop

A special pre-conference workshop on the encouragement of young women towards engineering and applied sciences was organized on June 26th 2005, within the context of the Joint IEEE International Symposium on Intelligent Control (ISIC’05) and Mediterranean Conference on Control and Automation (MED’05). The great success of the workshop sent a very encouraging message to both participants and organizers of the event. The main organizers of the workshop were the Electrical and Computer Engineering Department of the University of Cyprus (UCY) (which was also the main organizer of the Joint ISIC/MED’05 conference, along with IEEE and MCA), the Cyprus Ministry of Education and Culture, and the Electrical and Computer Engineering Department of the California State University, Los Angeles. The main objectives of the workshop were to address the issue of women under-representation and also increase awareness about gender bias issues in the areas of engineering and applied sciences education, by informing, motivating and, thus, encouraging young women to follow a career in engineering or applied sciences. This was a full-day event, with various activities, which brought together around 250 invited female students from various junior-high and high schools of Cyprus, interested parents, teachers, policy makers, government officials, and university faculty from Cyprus and other countries, such as the USA. The total number of participants was around 450 people. The workshop consisted of two basic parts. A team-based robotics competition took place during the first part, which was open only to invited students. The second part, which was open to all interested parties, included a panel discussion as well as exhibits and demonstrations from various fields in Engineering and Applied Sciences.
The robotics competition was a 4-hour event, including orientation and evaluation. Students were provided with appropriate equipment and instructions, and were asked to work in teams for the assembly, decoration, and demonstration of a simple programmable robot. The ultimate goal was to program the robot to move in a court, with targets and obstacles, such that it could collect the maximum number of points within a specific period of time. Winning teams were awarded with various gifts. Moreover, all participating students received a certificate of participation by the IEEE Cyprus Section. The enthusiasm, as well as competencies, demonstrated by the involved students during the competition was especially encouraging; it was a strong indication that such hands-on experience offering events are important in informing, bringing down stereotypes, and encouraging young women towards technical and technological fields.

The panel discussion that took place during the workshop was also very successful, attracting a large number of participants and addressing several interesting issues, both global and particular to the Cypriot society, economy, and industry. The panel included speakers from Cyprus and abroad: Prof. Elpida Keravnou-Papailiou (Vice Rector of Academic Affairs of UCY), Prof. Eleni Ryaciotaki-Boussalis (CSU-LA, USA), Dr. Michael Demetriou (WPI, USA), Dr. Maria Michael (UCY), Dr. Zena Poulli (Cyprus Ministry of Education and Culture), and Nikos Timotheou (CEO of Cyprus Telecommunication Authority). The Dean of the School of Engineering of the University of Cyprus, Prof. Andreas Alexandrou, served as the panel coordinator. The public had the opportunity to hear some of the experiences and views of the speakers, particularly related to future professional opportunities for women in engineering, science and technology in Cyprus and in Europe in general. Some of the issues addressed included women under-representation with focus on typical stereotypes, discriminatory work environments, older and more recent personal experiences of women practicing related occupations, various related statistics from around the world during the last century, current and future prospects in technology and engineering professions and measures
that the government and the society must take to encourage young people, women in particular, to follow a career in such professions.

In addition, the second part of the workshop included experimental and simulation-based exhibits in various Engineering and Applied Sciences disciplines, such as: Robotics, Bioengineering, Mechanical Engineering, Electric Power, Plant Information Systems, Sensor Networks, Mobile Communications and Telecommunications, Integrated Circuits and Computer-Aided Design, Electrical Signals, Lasers and Ultrasound Systems, Environmental Engineering—Waste Management, Civil Engineering, Computational Methods in Physics, Superconductivity, Control Systems, Electromagnetic Tomography, Animation of Hypersonic Vehicles, Space Telescopes, and Wafer Deposition. Most of the people that visited the exhibits showed a lot of enthusiasm, especially the young women, and have commented that the interactive nature of most of the exhibits was very helpful in understanding various Engineering areas and related occupations.

6.5 High School and Community Outreach

One of the main goals of the Department is to attract high quality students from the local high schools. In order to achieve this goal the Department has initiated a number of approaches such as mailing brochures to the student counselors and organizing workshops. Dr. Maria Michael, along with professors from Civil and Mechanical Engineering, organized a workshop for the students of the Larnaca area in 2004, in an effort to introduce the newly founded School of Engineering of the University of Cyprus and its departments to high school personnel, perspective students and their families. During that workshop Dr. Maria Michael presented the scope of the Electrical and Computer Engineering Department, as well as the entrance requirements to the Department, the courses taught and the teaching and research facilities available. In a question-and-answer session that followed the presentation, students and parents that participated in that workshop had an opportunity to ask questions about the profession of an Electrical Engineer and a Computer Engineer, the course requirements, the degrees offered by the Department, and the employment as well as postgraduate opportunities that will be presented to the students upon graduation.

6.6 Consulting, Services and Collaborations

- **Elias Kyriakides** serves as a member of the technical committee on Electrical Engineering of the “Cyprus Organization for Standardization” (CYS). Evaluation of proposed European technical standards and voting on their adoption as European standards (Jan. 2005-present).


- **Constantinos Pitris** serves as a reviewer for Hermes Research Center & Business Incubator, Nicosia, Cyprus for the evaluation of various proposals related to biomedical engineering, January 2004 – present.

- **Constantinos Pitris** serves as a reviewer for Ministry of Industry, Commerce and Tourism, Nicosia, Cyprus for the evaluation of various proposals related to biomedical engineering, January 2004 – present.

- **Christos Panayiota** serves as a consultant to the Hermes Research Center & Business Incubator, Nicosia, Cyprus. Evaluation of innovative business proposals (January 2004 – present.)

- **Marios Polycarpou** served as a member of an Ad-Hoc Committee to study the requirements and procedures for membership in the Cyprus Scientific and Technical Chamber (2003-2004.)
• George E. Georgiou was hired as an expert by the Union of Municipalities to draft criteria for phone mast and telecommunication network development. He also acts as an expert on Electromagnetics issues.

6.7 Invited & Public Talks


6.8 Newspaper Articles


6.9 Entrepreneurial Activities

6.9.1 1st Cyprus Entrepreneurial Competition

ECE faculty Christos Panayiotou was part of the team that won the First Prize at the 1st Cyprus Entrepreneurial Competition in December 2003.

“Meta Imaging Center,” First Prize at the 1st Cyprus Entrepreneurial Competition (CyEC), Dec. 2003

The Meta Imaging Center provides a service for outsourcing diagnostic image post processing. Through post processing, vital information can be extracted from an imaging dataset, helping the doctor in the diagnosis of a disease or in assessing the
response to treatment. Post-processing is currently only available in research centers due to the multidisciplinary expertise required. The Meta Imaging Center will make post-processing techniques widely available in an easy way: “you scan and send us your images, we analyze them and send you results in a form that helps your decision making.”

The winners of the competition (from left to right): I. Chrysanthou-Bausert, M. Nicolaou, Y. Chrysanthou and C. Panayiotou with former president G. Vasiliou at the awards ceremony.

6.9.2 2nd Cyprus Entrepreneurial Competition

ECE faculty Constantinos Pitris was part of the team that won the First Prize at the 2nd Cyprus Entrepreneurial Competition in July 2005.

“SELAScope Systems: Next Generation Endoscopy,” First Prize at the 2nd Cyprus Entrepreneurial Competition (CyEC), July 2005

SELAScope Systems proposes a new technology for the early diagnosis of colorectal cancer. The new procedure, based on optical molecular imaging, will combine a molecular marker of early cancer and an optical beacon thus enabling the detection of precancerous lesions even before they became clinically visible, also eliminating the need for biopsy. Such progress in the field of cancer screening and diagnosis will result in earlier and more effective treatment, with better prognosis for the patients and reduced costs for the healthcare system.

The winners of the entrepreneurship competition (from left to right): A. Odysseos, C. Pitris and S. Stelikou (absent was L. Economides) at the awards ceremony.
7. Outlook

The Electrical and Computer Engineering Department at the University of Cyprus was established in September 2003 when it admitted the first undergraduate and doctoral students. The current document is the first Biennial Report of the new department, covering the two-year period from September 2003 to August 2005.

Clearly, this is just the beginning for our new Department. Despite being at the very early stages of its existence, the ECE Department has had a number of noteworthy successes, especially in terms of research visibility, high quality publications and research funding. The Department has also been able to attract a significant number of high quality doctoral students, who are working on externally funded research projects. Teaching and research laboratories have been built to support the educational activities of a modern Electrical and Computer Engineering Department. The high reputation of the ECE faculty worldwide is evident by the appointment of one of the Department’s faculty as Editor-in-Chief of a prestigious journal, as well as by other key research appointments of other faculty.

The short-term goals of the ECE Department are to continue building its academic programs and laboratory infrastructure, as well as making headway in research performance. Some of the key short-term objectives are the following:

- Initiate the M.Sc. program in Computer Engineering. The corresponding program in Electrical Engineering started in September 2004, while the Ph.D. programs in both Electrical Engineering and Computer Engineering were initiated in September 2003.
- Increase the number of high quality doctoral students in Electrical Engineering and Computer Engineering. In parallel to the efforts to increase the number of postgraduate students, the ECE Department will intensify its efforts to obtain external research funding for supporting the doctoral students.
- Convert its undergraduate and postgraduate programs to the European Credit Transfer System (ECTS).
- Continue its outreach and collaboration efforts, with an eye in establishing mutually beneficent long-term relationships with the local industry and other organizations related to the field of electrical and computer engineering.
- Continue the efforts to attract high quality, high potential, academic personnel.

The foundation that has been built so far in terms of academic programs, research initiatives and collaborations, will definitely influence the future direction of the Department. The prospective outlook of the ECE Department relies on three key issues:

- The ability to attract and retain high quality personnel, including academic staff and technical/administrative personnel. It is also very important to be able to attract high quality undergraduate and postgraduate students, especially at the doctoral level.
- The construction of permanent buildings for the ECE Department, as part of the new University of Cyprus campus, will enable the Department to grow and reach its true potential.
- The creation of a teaching and research environment where all the people in the Department - academics, undergraduate and postgraduate students - can achieve their career goals.

The ECE Department would like to acknowledge the support that it has received so far by the Cyprus Government, the University of Cyprus, and the Cyprus Research Promotion Foundation. We hope that this support and collaboration will continue and be enhanced in the future.