



Fall 1994

[1994 Centennial Issue](#)

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ENROLLMENT UPDATE

As of September 1994 we have 33 graduate students, 30 seniors, 40 juniors, 51 sophomores, and 55 first-year students for a total of 176. Included in these figures are 65 computer engineering majors. We have 20 international students—10 graduate and 10 undergraduate. The freshman class had an average SAT score of 1121, and contains a National Merit scholar and one student with a perfect 1600 SAT score.

PERSONNEL UPDATE

Burnal Grant, "Bunny" to most, retired last June. He regularly stopped by while out riding his motorcycle and enjoying the wonderful fall weather we had. Have a great retirement Bunny!

[John Field](#) was reappointed as ECE Chair for a 5-year term.

[Rick Eason](#) and [Don Hummels](#) were promoted to Associate Professor with tenure effective this September. Congratulations to both.

Congratulations are also due to the following ECE faculty who were honored at the College's 1994 Fall Recognition Banquet: [Bruce Segee](#), for receiving the Young Faculty Teaching Award, [Jim Patton](#), for receiving the Young Faculty Research Award, [Fred Irons](#), for receiving the Ashley S. Campbell Award for his "outstanding dedication and contributions to the education of engineering students."

SCHOLARSHIPS

The following first-year students received scholarships named for emeriti faculty: Jesse Parks of Woodland was awarded the Carleton Brown Scholarship, Damian LaBree of Old Town was awarded the Walter Turner Scholarship, and Erik Maier of Bath was awarded the Waldo Libbey Scholarship. In addition, first-year students David Gahris, of Charleston, and Carl Houde, of Eliot, received Alumni Scholarships.

DEC Scholarships

Digital Equipment Corporation in Augusta, Maine offers scholarships targeted for women and minorities. This past year two of our students, Heather Smith of Sherman Mills, and Monica Puri of Orono, were selected as recipients. Both are sophomores majoring in electrical engineering. In addition to a financial award, the scholarship also provides for work experience at Augusta.

Castle Student

The Department named Eric Swanson, a junior from Gorham, as the fifth Castle student. Castle students are supported by an endowment set up by a generous gift from **Roger Clapp Castle '21**. The endowment also funds the Roger Clapp Castle and Virginia Averill Castle Professorship held by **Fred Irons**.

Spring Awards Banquet

At the Department's annual Spring Awards Banquet, Marianne Shaw, Robert Tukey, Jr., Chris Mallon, Joe Rogers, Adam Hodgdon, Cindy Zoldi, Derrick Morin and Deron Gerow received Robert N. Haskell Scholarships as the top students in their respective classes. Darlene Coolong and Danny Clavette received Alumni Scholarships; Eric Black received the Beverage Scholarship while Daryl Rawnsley received the RCA Beverage Scholarship. Adam Hodgdon received the David Holmes Scholarship. DEC and Castle scholars were also recognized at the Banquet.

NSF Young Scholars Program

Judy Robash, [Eric Beenfeldt](#) and [John Field](#) offered a Young Scholars Program (YSP) for the fourth time last summer. The YSP is sponsored by the Research Career Development Division of NSF's Directorate for Education and Human Resources as part of its effort to aid young men and women develop careers in science, mathematics and engineering. National Semiconductor of South Portland also provided support this year.

Our program acquaints high school students with a number of the career choices available in engineering. Specifically, the students learn about computer, electrical, civil and environmental, mechanical, surveying and chemical engineering. This is achieved by having brief lectures about each of the disciplines followed by "hands on" lab exercises as well as field trips. Additionally the students learn about engineering research by participating in on-going University projects. They also take a mini-course in digital logic systems and explore engineering ethics by discussing various real world situations. The mini- course shows the students what an "engi-neering" course is like and that they can do well in it.

Our program has 24 participants, runs three weeks in the summer, is residential and targets students, particularly young women, entering their junior or senior years in high school. There is also a follow-up project that the students work on with high school teachers during the academic year.

Castle Professor Report - [Fred Irons](#)

After taking early retirement from Lincoln Laboratory in Dec '89, I returned to teaching at the University of Maine as a way to have a base of

activity and to enjoy the fruits of teaching and working with young people. My position carried with it the distinction of being the first endowed Professorship in the Electrical Engineering Department; it is known as the Roger C. and Virginia A. Castle Professorship. The appointment carried some strings with it that have proved interesting from an educational point of view, namely that one student, known as the Castle student, shall be selected each year from the sophomore class. The selection is not based solely on scholarship but on overall performance, interest, and promise as a Loyal Maine graduate. The Castle student works with me on any project of mutual interest. Funds are available to buy parts and to provide a stipend for the student.

I now have three students in the pipeline and two graduates. The arrangement is an empowering act for the student. Several really worked hard in their sophomore year but became "A " students and went on to Graduate School. I am really enjoying this aspect of my current job.

Roger Castle is 95 years old now and lives in Damariscotta, ME. He had a 40 year career with AT& T and when we visit him a couple times each year he regales us with stories about his career and his experiences at the University of Maine. He is an inspiration to the students.

PH.D. PROGRAM STATUS

Some of you may have seen news articles last winter stating that the Board of Trustees had approved a Ph.D. program in Electrical Engineering. This is true as far as it goes, but there were some qualifications added. The Department felt that we needed two additional faculty slots to ensure a quality program. The program was approved pending funding for these slots, but funding was not allocated because of the University's current financial condition. At the present time we are looking at funding these positions initially through external grant money; several such grants are pending now. We are hopeful that we will have a Ph.D. program within a few years.

FACULTY ACTIVITIES

[Eric Beenfeldt](#) and [Rick Eason](#) have continued work on the development of a shoe trimming machine for the Dexter Shoe Co. The prototype of the machine was developed last year and successfully tested in a production environment. Improvements were then made to the prototype to upgrade the software, enhance the machine's durability, and make it easier to manufacture. One of these production machines is on line and working and others are being manufactured. Eric and Rick are now looking into designing machines to perform other shoe manufacturing operations.

Eric is also revising the first year course ECE 172. The course will concentrate on assembly language programming for a microcontroller and include some discussion of logic devices and their relation to microprocessors and microcontrollers. The microcontroller (MC68HC11) used in the course will be part of Motorola's EVBU evaluation board. The single board computer can be programmed from a personal computer and has an area on it for wire wrapping additional circuitry to customize its operation. During the labs, students will have a chance to solder and wire wrap as well as write and debug code.

Rick has also been involved in several other robotics projects with his students. Over the summer one of his students began working on replacing the damaged control unit on the "Blue Beast," the department's large industrial robot, with a PC based control system. This will provide the Robotics Laboratory with a system which is much easier to use for sensing and intelligence experiments. They are also updating the sensory and control systems on Magog, one of the lab's mobile robots. Two NSF young scholars students wrote navigation software for this robot over the summer. Rick is also leading a team of students who are designing and building a robot to enter in a competition in Michigan next May. This robot must navigate autonomously around an 800' outdoor track marked by white lines and containing obstacles, inclines and a sand pit.

[Duane Hanselman](#) and [Bruce Littlefield](#) teamed up to write the tutorial sections for the Prentice Hall text *The Student Edition of MATLAB* version 4. In an effort to make MATLAB more accessible to first time users, they wrote follow-along tutorials complete with examples highlighting the cartoon family "The Simpsons." As a follow-on, they signed a contract to write a general purpose trade book on the use of MATLAB entitled "Mastering MATLAB." This text will be out in the Fall of 1995. The goal of the text is to give users an alternative resource for learning MATLAB and using it productively.

Duane revised the software and text of his text *MATLAB Tools for Control System Analysis and Design*. The resulting second edition is due out in time for Spring '95 adoption. The first edition, which was not compatible with version 4 of MATLAB, sold over 2,000 copies in the first six months of this year.

Duane gave two short courses based on his book *Brushless Permanent Magnet Motor Design* this year. The second of these was through the University of Wisconsin's Dept. of Engineering Professional Development and was co-taught by T.J.E. Miller, a world-renowned motor design expert. In March 1995, Duane will give a motor design short course in Rockford, Illinois under the auspices of the Small Motor Manufacturers Association.

As a result of the publishing of his text *Brushless Permanent Magnet Motor Design*, Duane was hired as an expert witness for the plaintiff in a motor patent infringement lawsuit brought by General Electric against Emerson Electric. With millions of dollars at stake the results of this lawsuit will have a significant impact on the brushless motor business.

Duane also interacted with the Naval Undersea Warfare Center (NUWC) in Newport RI for his sixth consecutive summer. However, because of the downward trend in defense spending, his long term association with NUWC may be coming to an end.

The Communications Devices and Applications Laboratory (CDAL), headed by [Don Hummels](#) and [Fred Irons](#), has been awarded a \$334,000 grant from the Army Research office to expand its high-speed analog-to-digital converter (ADC) development capability. The grant includes new equipment — network and spectrum analyzers and two synthesizers — which will extend the ADC measurement capability to 20 GHz. The CDAL research group has become widely recognized for work in wide-band signal processing devices. The testing facility is capable of accurately characterizing most commercially available high-performance ADCs for error correction to improve dynamic performance. With the new funding, CDAL can expand its signal generation and measurement capability beyond the present test capabilities of any other ADC test facility.

CDAL also continues involvement with an ongoing research project supported by Advanced Research Projects Agency (ARPA). The project involves the development of two state-of-the-art converters - a 12-bit 100 MSPS converter, and an 8-bit, 3 GSPS converter. CDAL and the MIT Lincoln Laboratory have been selected to provide test support for the program. As part of the program, CDAL is interacting with the foundries developing the technology to produce the devices. These foundries include Texas Instruments, Rockwell, TRW, and Hughes. The primary effort to date has been to develop innovative test procedures which isolate various ADC error mechanisms using a dynamic characterization of the devices. As devices become available from the foundries, these procedures will be applied to provide the foundries with a diagnostic tool, to not only evaluate the performance of the device, but also indicate likely distortion mechanisms. Other CDAL work includes a project with the Motorola Cellular Infrastructure Division to develop ADC compensation procedures for cellular telephone base-stations, and a project with the Naval Undersea Warfare Center to develop acoustic ping detection and timing algorithms for a digital acoustic signal processor.

The research group currently includes two faculty, four graduate students, and six undergraduate students.

[Ryszard Lec](#), Research Professor in ECE and Technical Leader of the Industrial Process Control Sensor program at the University of Maine, continued his research and educational efforts in the area of sensors. Two years ago he and **Dr. Vetelino** received a three year grant from the National Science Foundation (NSF) to integrate sensors into the ECE curriculum. For the first two years effort was focused on the development of an undergraduate sensor program which resulted in two new courses and an Undergraduate Sensor Laboratory. In year three a graduate sensor program is being developed. Last spring Dr. Lec offered a new graduate course "Design and Modeling of Acoustic Sensors." The sensor curriculum trains students in the theory, design, fabrication and testing of sensors.

Dr. Lec continues his collaboration with other engineering departments on campus. In a joint effort with Dr. Genco from the Chemical Engineering Department an acoustic emission (AE) chemical sensor is being developed. This sensor listens to chemical reactions and is capable of recognizing a specific chemical reaction. An ultimate goal is to develop smart AE chemical sensors with such features as self-calibrating, self-diagnostic and life-time prediction. Also Dr. Lec has started a collaboration with Dr. Caccese from the Mechanical Engineering Department focused on developing of acoustic sensors for monitoring concrete and timber bridges.

Dr. Lec provided assistance and expertise to Maine industry. In collaboration with BIODÉ Inc., a small company located in Portland, Maine, he is developing a new homogeneous immunosensor based on acoustic absorption phenomena. An important feature of this sensor is that it significantly simplifies the complicated and time consuming procedures of currently available commercial immunosensors.

[Mohamad Musavi](#) spent ten weeks in the Air Force Rome Laboratory, Intelligence and Reconnaissance Directorate, Rome, NY, working on an AFOSR sponsored research program. This was his second straight year at the Rome Laboratory. He has received a contract from the laboratory to continue his research at the University of Maine. His Air Force research relates to automatic extraction of geo-reference data from Digital Terrain Elevation Data (DTED) and image registration using artificial neural networks.

In addition, he has also received a grant from the DOE/Maine EPSCoR program to work on classification of mouse chromosomes using artificial neural networks. His effort in this area is in collaboration with The Jackson Laboratory, Bar Harbor, ME. For the continuation of this project he has submitted a proposal with The Jackson Laboratory under the Human Genome Cluster effort to the DOE/EPSCoR program.

Dr. Musavi has also initiated and developed a joint proposal between the Electrical and Computer Engineering Department and the Chemical Engineering Department for development of intelligent systems expertise in the state of Maine. This proposal has been submitted to the DOE/EPSCoR program.

In other activities, Dr. Musavi has collaborated with the Mechanical and Civil Engineering Departments on the development of a proposal entitled "An Intelligent Monitoring/Diagnostic System for Bridges." He has also submitted a proposal to Dexter Shoe Company on development of a video-imaging system. In addition, he has collaborated with the S.D. Warren Company for the introduction and development of artificial neural network capabilities in their pulp and paper processes.

[Jim Patton](#) continued work on various projects funded by NSF and the Power Research Association (PRA). The PRA is a consortium of electric utilities and paper manufacturers who pool their resources to support power system research applications. Presently undergraduates and graduate students are working with Jim on a variety of projects, some of which are described below.

A flexible, reconfigurable, and portable data acquisition system was designed and built to use on NSF and PRA projects. On the NSF project, the data acquisition system will be used to characterize real and reactive power response to perturbations on the power system caused by sudden voltage changes. The objective is to characterize static and dynamic load using a neural network. The data acquisition system will also be used as a multi-channel transient event recorder and harmonics analyzer in power quality studies for CMP and Maine Yankee.

Jim obtained funding from the National Science Foundation to support undergraduate power system education. An interactive multimedia-based hydro-generation operations simulator will be developed for instructional purposes.

A MATLAB-based three phase distribution load flow program was developed. The program is capable of modeling line and load unbalance, voltage supported buses, networks, voltage regulators, line drop compensators, dispersed generation, angle shifting transformers, constant power, current, and impedance-type buses. The program will applied to part of Bangor Hydro's distribution system.

At the request of PRA companies, Jim organized an Electrical Professional Engineering Review course over

the University interactive television system.

ITV courses were taught in "Advanced Faulted Power System Analysis" and Special Topics (transient stability and power quality). This fall Jim is participating in a course, "Power Generation, Operation, and Control," transmitted to our students from Worcester Polytechnic Institute over the Picture-Tel teleconferencing system. In the spring Jim will offer a course in transient phenomena to WPI over the system and is hoping to offer similar courses to Maine industry over a teleconferencing system.

[Bruce Segee](#) continues to be active in teaching as well as Instrumentation Research Laboratory endeavors. The Instrumentation Research Laboratory is dedicated to research, development, and education related to instrumentation and currently supports four undergraduate students and three graduate students. Bruce has introduced a course in Industrial Computer Control that emphasizes PLC programming and communication between PLCs and PCs as well as standard interfacing techniques.

A companion course is under development that emphasizes embedded control, distributed control, fuzzy logic and neural networks.

Bruce is to receiving industrial support as well as support from the National Science Foundation. Industrial support has come from Dexter Shoe Company, International Paper Company, C& H Engineering, Middleton Building supply, as well as several others. Support from the NSF is in the form of a Research Initiation Award for the application of Artificial Neural Networks to Gas Sensors. Additionally, Bruce has worked with students supported by NSF Young Scholars Program, NSF Research Experiences for Undergraduates, Upward Bound, and other programs for High School and/or Undergraduate students.

The largest project undertaken by the Instrumentation Research Laboratory, the automation of the Dexter Shoe Company, Milo stitching room, has been completed and is very successful. Work is underway to study how to install similar systems in other Dexter Shoe factories. Numerous smaller projects including automation for sawmills have also been successful and have provided real-world experiences for the students working on them.

[John F. Vetelino](#) and his research group continue to work on basic and applied research in gas sensors, biosensors, corrosion sensors and water quality sensors. The last two areas represent new research directions and involve collaboration with chemists for the corrosion sensors and civil engineers for the water quality sensors. The sensor work is supported by NSF, Anderson Laboratories, Champion Paper Company, and the BIODÉ Corporation.

Dr. Vetelino was named to the organizing committee for the 1996 International Chemical Sensors meeting to be held in Washington, D.C. Dr. Vetelino, Carl Freeman, Associate Professor of Electrical Engineering Technology, and Dr. Jeffrey Andle, a recent electrical engineering Ph.D. graduate, formed a company called Sensor Research and Development Company. This company is involved in commercializing sensors developed in the UM sensor research group.

Dr. Vetelino received a National Science Foundation grant that supports undergraduate research in the Electrical and Computer Engineering Department. This ten week summer program involves undergraduates from the University of Maine and other U.S. universities in departmental research activities, some of which are industrially sponsored. At the end of the summer, students write reports describing their research activities and also make presentations.

Dr. Vetelino was a co-PI in a \$500,000 NSF equipment grant to develop a thin film processing facility at the University of Maine. Together with UM matching funds the grant totals almost 1 million dollars and will help make the UM sensor research program one of the most advanced in the United States.

[Seth Wolpert](#) continues to progress in his NSF-sponsored research in modeling nervous networks using custom silicon microchips. His three-year grant is now in its final year, and progress this past year has been remarkable. He has authored two journal articles from his recent findings, and submitted a follow-on proposal to perform a similar investigation with the mammalian visual system. In support of this grant, he has received an equipment grant from the NSF, which he used to purchase a DEC 3000 work station and electronic test equipment.

Dr. Wolpert has continued his work in developing a noninvasive sensor for nerve impulses, and recently completed a journal article on this work. This is a line of research he has pursued in collaboration with Leonard Kass of the Zoology Department, and proposed to the Whitaker Foundation.

Dr. Wolpert has recently initiated a new line of research in collaboration with the Neural Engineering Clinic of Augusta, ME. In association with a neurosurgeon and biomedical engineer there and researchers from industry and the University of Alberta, he is working on developing computer-based models of motion in artificially stimulated quadriplegic patients. This work will eventually lead to development of an electronic

controller that will enable a paralyzed human subject to stand up, sit down, shift weight from side to side while seated, and step over small architectural barriers.

In other work, Dr. Wolpert is participating in an EPSCoR proposal to establish a center of expertise in intelligent systems, and another proposal to obtain subsidies from the NSF to provide microchip fabrication of student projects. In addition, he will serving as host and conference chair for the IEEE Northeast Bioengineering Conference, to be held this spring in Maine for the first time in its 21 year history.

This year, Dr. Wolpert is serving as a research mentor for two McNair Scholars' students. He is also mentoring research for five undergraduates, including two NSF-REU students. This past summer, he also supervised two NSF Young Scholars students from area high schools, visited two high schools as a part of National Engineers' Week, and conducted tours of his research facility on several occasions.

ALUMNI NEWS

Andy Alexander '87 received a PhD in Optical Sciences from the University of Arizona in May, 1994. His thesis topic was Evaluation of Illumination Wavelengths for Fluorescence Detection of Atherosclerosis. He has accepted a Post Doctoral position in Clinical Imaging Systems in the Department of Radiology at the University of Utah in Salt Lake City, Utah.

Ray Bowden III '83 is a member of technical staff at Ascom Timeplex in Acton, MA. Prior to going to Ascom Timeplex, Ray was employed by Raytheon in Portsmouth, RI, Bull HN in Billerica, MA, and Motorola in Canton, MA. At Raytheon he designed various 68000-based controller systems. At Bull he designed several boards for their mini-computer line. While at Motorola he was involved in the design of a wide area network ATM switch. His current assignment at Ascom Timeplex involves the design of various ATM network interface cards.

He holds 5 patents as a result of his work. While at Bull, he obtained an MSEE from the University of Lowell. He and his wife, Donna, live in Tewksbury, MA, with their daughters, Lindsey 3, and Sarah 1.

Eric Daigle '89 is an Instrument Engineer with Yemen-Hunt, a subsidiary of Hunt Oil Co. of Dallas, TX. For the last two years he has been based in Yemen working on the construction of oil and gas production facilities, including cryogenic gas facilities. He is responsible for the design and implementation of software for networked PLCs that control the processes.

Michael Daughan '85 is an Engineer III at Newport News Shipbuilding. He is the lead engineer for the steering, diving, and depth, control systems on the SEAWOLF nuclear attack submarine. He received an MSEE from the University of Virginia in 1993; his concentration was in control systems and fault tolerant systems design and analysis. He is living in Hampton, VA.

Brian Edwards '89 has been working at Enercon, a small firm in Gray, ME for about 5 years. He and Emily Faragher, also class of '89, were married in October, 1990. They are living in Portland. He sails in the summer, mountain bikes all year round and would love to hear from old friends.

James Hornbrook, '90 is an Electrical Project Engineer with Border Electric Company. He was married to Kristen Figura of Yarmouth on April 3, 1993. They are living in Calais.

Shawn Kennedy BS '90, MS '92 is an Electronics Engineer at the Naval Undersea Warfare Center in Newport, RI. He lives in Middletown, RI. He is working on developing and implementing digital signal processing algorithms. He and Professor Don Hummels have several ongoing projects in this area.

Jeffrey Matthews, '91 is an Electrical Engineer with SMRT/Stevens Morton Rose & Thompson, a Portland architectural firm. He was married to Heidi E. Young on September 2, 1992. They are living in Auburn with their son, Brandon who was born March 31, 1993.

Larry F. Martin '77 is a Principal Engineer in the Component Engineering Group at Digital Equipment Corporation, Colorado Springs, CO. His primary responsibilities are to provide support on electrical components, e.g., bipolar and CMOS standard logic, programmable logic, and custom bipolar logic as well as delaylines, crystals, oscillators, and capacitors. This includes evaluating new devices, trouble-shooting older ones, and advising on newly available device technologies as well as older ones going end-of-life. Larry enjoys working on older vehicles, skiing and hunting. He and his wife, Sally, live in Colorado Springs and share their house with two 10-pound male iguanas. Editor's note; Larry volunteered that two things from his college days that helped him a great deal in his career were his co-op work experience and "writing those dreaded lab reports"!

Robert Plesset '81, is a Senior Unix Technical Consultant at Fannie Mae in Washington, DC. He was married to Rochelle Kauffman on September 2, 1993.

She is a Senior Counsel in the Division of Investment Management of the SEC. They are living in Potomac, MD.

Susan Goodeil Rice '86 has taken the position of Manager of Information Services at Coastal Telco Services in Damariscotta, ME after working for GE Aerospace in Utica, NY since her graduation. She was married to Calvin Rice on September September 17, 1994 and they are living in Damariscotta. Sue also serves on the Department's Visiting Committee.

Glen Riley '85 is Manager of the Product Innovation Center of Philips Semiconductors in Albuquerque, New Mexico, where he is responsible for design engineering, product engineering, and strategic marketing. Prior to moving to Philips this past summer, he was the Technical Marketing and Applications Engineering Manager for AT& T Microelectronics' Field Programmable Gate Array (FPGA) product line. He and his wife, Judy, live in Albuquerque near the Sandia Mountains with their daughter Erica, 5 and son Austin, 4.

Matthew Rollender, '87 is a Senior Product Marketing Engineer with Intel's Video Semiconductor Components Division in Phoenix, AZ. He received an MBA from Boston University in December, 1993.

William H. Tozier '48 is retired from Central Maine Power. After leaving the US Army Signal Corps he entered the Bentley School where he received a degree in accounting in 1958. He notes that his professional career was as an accountant although his engineering background gave him an appreciation for CMP's projects. He is now enjoying traveling around the US including visiting sites like the Hoover Dam, Edison Home/Lab, and the Kennedy Space Center.

Frank White, BS '77, MS '78, is a Senior Engineer in IBM's Microelectronics Division in Essex Junction, VT. He is involved in process development for a variety of logic devices including SRAMs, microprocessors, and ASICs. He and his wife Judy live in Essex Junction, within biking distance of IBM.

Editor's Note: The following alumni have careers that are somewhat different than might be expected for an ECE Department graduate.

Thomas Jendrysik '67 is a Foreign Service Specialist Officer with the Bureau of Diplomatic Security. He has been based at American Diplomat Missions in New Delhi, Beirut, Casablanca, Rome, and Moscow as well as several tours in Washington DC. Presently he is located in Fort Lauderdale, FL at the regional office which covers posts in South and Central America.

At his present level he spends most of his time with "paperwork" and policy decisions but previously he was more involved with engineering. One of the major events in his career was to play a central role in the discovery of clandestine listening devices in the Leningrad (now St. Petersburg) Consulate in the former USSR. After the discovery, he was deeply involved in its rebuilding. He also worked on the infamous new American Embassy office building in Moscow that had "bugs" everywhere.

His office was initially created to provide protection from clandestine listening devices. However, over the past 30 years, it has become responsible for a wide range of security devices such as special locks, alarm systems, closed circuit television, detectors for explosives and metal, as well as a wide variety of equipment designed to extend the range of guard forces and to improve physical security at embassies and consulates. The emphasis now is to design out possible problems before construction. Computer security is another area currently receiving much attention, attention which is likely to grow in the foreseeable future.

Denham S. Ward '69 M.D., Ph.D. is Professor and Chairman of the Department of Anesthesiology; School of Medicine and Dentistry at the University of Rochester, Rochester, NY. He also is a Professor of Electrical Engineering in the School of Engineering there. His department has 35 faculty who are all involved in teaching and research. The teaching includes medical education in anesthesiology (and help with physiology and pharmacology) for medical students as well as education in all aspects of anesthesiology for the Anesthesiology residents (post MD training). They also provide clinical care at the University hospital (Strong Memorial) and give over 20,000 anesthetics a year. Denham continues research in his respiratory physiology laboratory and recently had a EE Master's student in the laboratory developing a computer model of chest movement during breathing. This included data collection with a device that measured chest movement using inductance changes. He lives in Rochester with his wife, Debbie Lipscomb and their 2.5 year old, Hannah Ward. When time allows they enjoy boating on the Erie Canal.

EXTERNAL FUNDING

The following is a list of external funding available for expenditure between July 1993 and June 1994. If you would like to know more about any of these grants please contact us.

Principal Investigators	Title	Sponsor	Amount
Beenfeldt, Field, Robash	Engineering Experience for High School Students	NSF	\$41,050

Beenfeldt, Eason	SST Project	Dexter Shoe	\$67,935
Eason, R.	Software, Hardware + Components	Altera	\$50,000
Hanselman, D.	IPA Agreement - Year 5	DoD	\$35,565
Hummels, D.	Acoustic Impact Data Modelling Study -Yr. 2	NUWC	\$24,474
Hummels, Irons	Cellular Telephone (with extension)	Motorola	\$16,230
Hummels, Musavi	Acoustic Impact Data Modelling Study	NUWC	\$23,742
Irons, Hummels	ADC Test Support Program	ONR	\$59,607
Lec, Vetelino	Integration of Sensors into the EE Curriculum	NSF	\$80,704
Patton, J.	Static & Dynamic Dist System Using Prob NN	NSF	\$31,208
Patton, J.	Power Engineering Research	Various Ind.	\$23,870
Segee, B.	Dexter Milo Factory Automation	Dexter Shoe	\$220,450
Segee, B.	RIA:Application of Neural Networks to Gas Sensors	NSF	\$25,762
Segee, B.	Maine Research Internships for Teachers and Students	ME Science & Tech. Found.	\$4,000
Sheppard E. M.	MITRE Student Intern Program	MITRE Corp	\$7,000
Vetelino, J.	Research Experience for Undergraduates	NSF	\$55,262
Vetelino, Dwyer	Study of SAW Microsensor for Gas Detection	NSF	\$109,999
Vetelino, J.	Corrosion Sensor	Champion Paper	\$1,500
Wolpert, S.	Examination of a Neural Algorithm Using VLSI-Based Models	NSF	\$29,960
Wolpert, S.	CISE Research Instrumentation	NSF	\$26,465
Wolpert, S.	MOSIS - 1993-94	NSF	\$16,500
Total			\$951,283

FACULTY PUBLICATIONS

(July 1993 to June 1994)

JOURNALS

Hanselman, Duane C., "Minimum Torque Ripple, Maximum Efficiency Excitation of Brushless Permanent Magnet Motors," *IEEE Transactions on Industrial Electronics*, Vol 41. No. 3, pgs. 292-300, June 1994.

Musavi, M. T., K. H. Chan, D.M. Hummels, and K. Kalantri, "On the Generalization Ability of Neural Network Classifiers," *IEEE Trans. On Pattern Anal. and Machine Intell.*, PAMI-16, pp. 659-663, June 1994

Musavi, M.T., Sweeney Jr., W.P., and J.N. Guidi, "Classification of Chromosomes Using a Probabilistic Neural Network," *Cytometry*, Vol. 16, No. 1, 17-24, May 1994.

Vetelino, J.F., Galipeau, D., Feger, C., "Using Surface Acoustic Waves to Study Properties of Polyimide Films," *Plastic in Engineering*, Vol. XLIX No. 12, pp. 31-34., Dec. 1993.

Wolpert, S., Micheli-Tzanakou, E., "Silicon Models of Lateral Inhibition," *IEEE Trans. on Neural Networks*, Vol. 4, Nov., 1993, p. 955.

CONFERENCE PROCEEDINGS

Hanselman, Duane C., "Sources of Torque Ripple in Brushless Permanent-Magnet Motors,; Proc. of 23rd Annual Incremental Motion Control Systems and Devices Symposium (IMCSD), San Jose, CA, June 14-16, 1994.

Hummels, D.M., F. H. Irons, R. Cook, and I. Papantonopoulos, "Characterization of ADCs Using a Non-iterative Procedure," Proc. of IEEE International Symposium on Circuits and Systems, London, May 1994.

Hummels, D.M., M.T. Musavi, and W. Ahmed, "Adaptive RBF Neural Network in Signal Detection," Proc. of the IEEE Inter. Symposium on Circuits and Systems, London, May 1994.

Hummels, D.M., Ahmed, W., and M.T. Musavi, "Adaptive Locally Optimal Detection Using RBF Neural Network," Proc. of IEEE International Conference on Neural Networks (ICSS), June 26-July 2, 1994.

Musavi, M.T., Lec, R.M., Pendse, H.P., "Radial Basis Function Neural Network in Sensor Design," Proc. 1993 World Conf. on Neural Networks (WCNN), Portland, OR, July 11-15, 1993.

Musavi, M.T., Hummels, D.M., Ahmed, W., "Detection of Small Signals Using an Unsupervised Radial Basis Function Network," Proc. 1993 World Conf. on Neural Networks (WCNN), Portland, OR, July 11-15, 1993.

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DEPARTMENT CENTENNIAL

1994-95 is the Department's Centennial year. One hundred years ago, in 1894, the first electrical engineering course was offered at the University of Maine.

Department History - One of the activities planned to mark this event is the development of a Department history. Emeritus Professor Walter Turner has made an excellent start on recording our past but we would like to ask your help too. What do you think should be included? We are interested in old photos (which we will try to return but cannot guarantee), reminiscences, historical information, and anything else you think is appropriate.

Department Centennial Fund - We are also planning to establish a Departmental Centennial Fund to help support the Department as it starts its second 100 years. This would be an endowed fund where the income would go to, e.g., scholarships, equipment purchases, or student wages; in other words, anything that will

help the Department better meet its goals. Donations to this fund would be credited to your alumni account and also help the Department. The form on the last page should be torn off and mailed back with your gift; please be sure the mailing label is still attached.

An aside - Normally, about this time of year, each of the Engineering Departments sends out a letter to its alumni/ae requesting donations. This year we are not going to do this. This will be the only Department appeal you will receive this year and, if successful, we plan to continue the practice. Let us know what you think.

Alumni Input

If you enjoyed reading about your former classmates and friends and would like to share information about what you are doing, please fill out the form below and send it to us.

Also, if you would like us to include an article in the newsletter about a particular subject, e.g., the current curriculum or more detail about our research and development projects, please let us know.

University of Maine

Department of Electrical and Computer Engineering

Alumni Input

Name _____

Degree/Year _____

E-Mail Address _____

Telephone No. _____

Address Change?

News, Current Job, Comments, Input for Department History

You have my support!

_____ I/We would like to support the Department's Centennial Fund drive.

_____ Enclosed is my check for \$ _____ made payable to the University of Maine.

_____ Please charge my _____ Visa _____ Mastercard # _____

Expiration Date ___/___ Signature _____

_____ I wish to pledge \$ _____

Please send a reminder over the next _____ (months)/(years) beginning ___/___/_____.

Thank you!

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