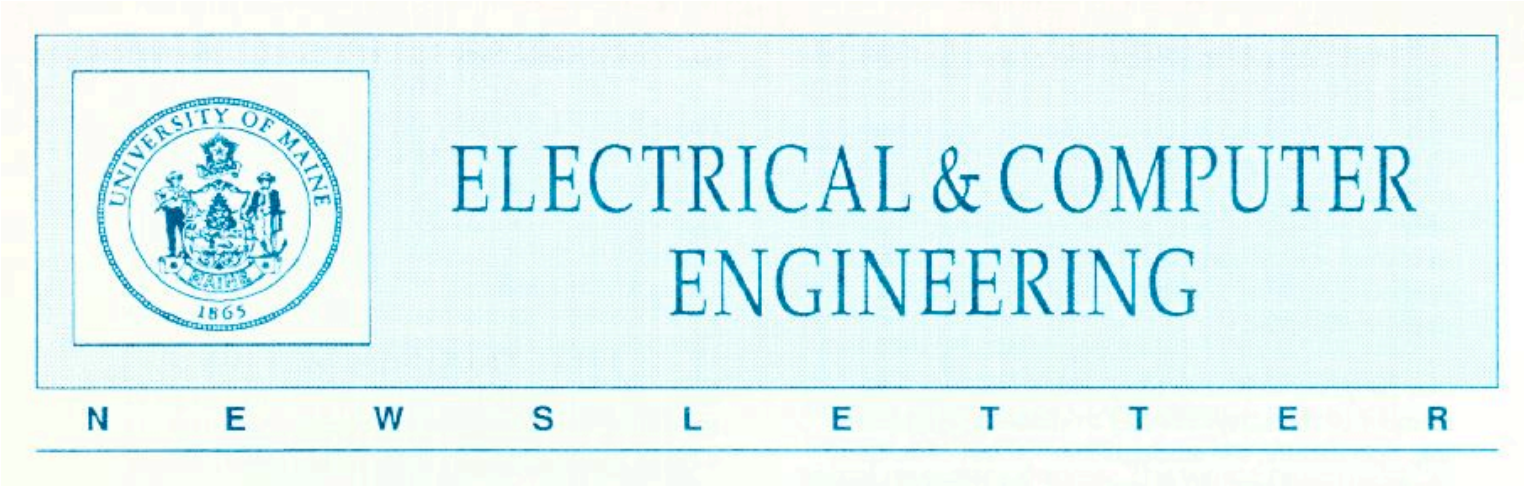

Fall 1995

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See our WWW site at http://www.eece.maine.edu

Last year's newsletter is also available.

ENROLLMENT UPDATE

As of September 1995 we have 31 graduate students, 31 seniors, 33 juniors, 49 sophomores, and 48 first-year students for a total of 192. Included in these figures are 68 computer engineering majors and 6 ELE/CEN majors. We have 18 international students-8 graduate and 10 undergraduate. The freshman class had an average SAT score of 1142 under the "old" system.

PERSONNEL UPDATE

Judy Robash left the Department last January to work for Animated Images in Camden, ME. She resides in Lincolnville when she isn't traveling around the world on job related trips.

Congratulations are due to **Bruce Segee** who was honored at the College's 1995 Fall Recognition Banquet for receiving the Young Faculty Research Award.

Andy Sheaff joined the Department this fall as a Systems Administrator. He will be working with Bruce Littlefield to help the Department keep pace with our burgeoning computer usage.

Seth Wolpert left the Department this summer to accept a position at the Pennsylvania State University at Harrisburg.

DONATIONS

As a reminder, if you want your alumni donation to benefit the ECE Department, it is very important that you either send the donation to the ECE Department directly or write "For ECE Department" on your donation card and/or check. In either case your gift will be credited to your alumni record and also help the Department. Presently, we are using donations to establish an endowed fund, the ECE Department Centennial Fund. The interest from this fund will be used to support Department needs; for example, equipment purchases are a particular need now.

CENTENNIAL CELEBRATION OPEN HOUSE

The Department's Centennial year was 1994-1995. One hundred years earlier, in 1894, the first electrical engineering course was offered at UMaine. To help celebrate the occasion, we held an Open House on June

3, 1995, in conjunction with Reunion Weekend. There were lab tours, presentations on current research and development projects, and a luncheon. Ned Sheppard was MC at the luncheon and Lou McNally, host of Maine Public Television's popular *Made in Maine* series, was the after-dinner speaker. Several lucky attendees won antique instruments as door prizes. Over 80 alumni and friends attended what was a very enjoyable event.

Pictures of the event are available here.

DEPARTMENT HISTORY

Professor Emeritus Walter W. Turner compiled a record of the ECE Department entitled *A History of Electrical Engineering Education at the University of Maine 1894-1994*. His goal was "to identify those faculty who have had major influence on the development of the department and to demonstrate that the department, through its course offerings, was able to keep up to date with respect to developments in industry." As part of the history he included a list of all faculty and their dates of service as well as curricula from the early years of the EE program. Copies are available on request.

MAJOR GRANT RECEIVED

The Department received a commitment from the Department of Energy EPSCoR program to fund a project titled, "Development of Intelligent Systems Expertise in the State of Maine." The commitment is for a $412,000 one year award with possible (likely) second and third year extensions totaling $1,241,120 over the three years of the project.

This project provides funds for five ECE faculty, two chemical engineering faculty and one USM faculty member to work in Maine companies on a regular basis seeking opportunities to apply intelligent systems methodologies to save energy and boost productivity. Their efforts will be focused on the application of intelligent systems technology to promote energy-efficiency and enhanced productivity in the electric power, pulp and paper, and a variety of smaller industries within the State. Intelligent systems, as used here, connotes advanced sensor applications, computer automation, adaptive/robust control, distributed processing, networking, and database management.

The highlights include:

- Faculty and student internships at industrial facilities.
- Industry outreach education programs; short courses, seminars, and project interaction via teleconferencing technology.
- A teleconferencing studio and five remote PC-based facilities at industrial sites.
- One additional faculty position for the electric power systems area in the second and third years of the grant.
- Colloquia; annual conferences and workshops, specialized tutorials.
- Additional funding opportunities; proposals will be submitted to appropriate Federal and State agencies to seek funding for research projects identified during on-site work experiences.

This grant shows great promise in forming liaisons that will give faculty and students "real world" experiences while helping to address industrial problems.

SCHOLARSHIPS

The following first-year students received scholarships named after emeriti faculty: S. Brandon Keller of Norridgewock received the Carleton Brown Scholarship and Thomas D. Kenney of Ashland received the Walter Turner Scholarship.

Castle Student

The Department named Gina Kelso, a junior from Clifton, as the sixth 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 Distinguished Professorship held by **Fred Irons**.

Spring Awards Banquet

At the Department's annual Spring Awards Banquet, Robert Tukey, Adam Hodgdon, Cindy Zoldi, and

Darlene Coolong received Walter Joseph Creamer scholarships. Jason C. Morneault, Monica Puri, and Christopher J. Mallon received Robert N. Haskell scholarships; Seth A. Pouwels and Joseph Rogers received David Dunlap Holmes scholarships; James McDonald received the Harold H. Beverage scholarship, and Kristoffer D. Fleming received the RCA Harold H. Beverage scholarship. DEC and Castle scholars were also recognized at the Banquet.

NSF Young Scholars Program

Eric Beenfeldt and **John Field** offered a Young Scholars Program (YSP) for the fifth 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, spatial information, 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 "engineering" course is like and that they can do well in it.

Our program has 24 participants, ran four 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.

FACULTY ACTIVITIES

Eric Beenfeldt and **Rick Eason** have continued work on the shoe trimming machine they developed for the Dexter Shoe Co. Recent work has focused on a complete redesign of the sensing unit. Many software enhancements have also been made. Dexter has had six of these machines on line since January 1995, and eight more will go on line by December 1995. Eric and Rick are also currently looking into projects at several other Maine companies.

Rick has also been involved in robotics projects with his students. In one effort, a team of students is designing a mobile robot for entry into the Fourth Annual International Autonomous Ground Robotics Vehicle Competition next summer. This competition requires a robot to navigate autonomously around an 800' outdoor track marked by white lines and containing obstacles, hairpin turns, inclines, and a sand pit. The team is modifying a Honda Odyssey dune buggy by adding electric motors for steering and propulsion, cameras for sensing white lines, ultrasonic sensors for detecting obstacles, and a Pentium for intelligence. In addition to designing and constructing the hardware, the team is also writing the navigation and control software.

Duane Hanselman's and **Bruce Littlefield's** text, *Mastering MATLAB*, was published in early November. The text is a general trade book that offers a comprehensive tutorial and reference for the software program MATLAB. Given the widespread use of MATLAB and the lack of competing texts, Duane and Bruce hope the text will be successful.

Duane will begin work on his sixth book in early 1996. He will co-author the 8th edition of *Automatic Control Systems*, an undergraduate control systems textbook. Previous editions of the text were sole-authored by Duane's Ph.D. advisor B.C. Kuo, Professor Emeritus at the University of Illinois.

Again this year Duane will give a brushless DC motor design short course based in part on his book *Brushless Permanent Magnet Motor Design*. The course will be given in March in Rockford, IL under the auspices of the Small Motor Manufacturers Association.

Based on the work Duane performed for the Naval Undersea Warfare Center in Newport RI, he received a contract for continuing work with Knolls Atomic Power Laboratory in Schenectady NY. Both of these organizations are involved in the design of low noise, high power density brushless DC motors for naval undersea applications.

In addition to the above work, Duane continues to consult with a variety of industries regarding brushless

DC motors. For example, one company recently sought advice about producing brushless DC motors made almost entirely out of plastic. Though the motors do not have the performance capabilities of motors constructed from electrical steel, they are inexpensive and therefore able to compete in application areas currently dominated by brush DC motors and shaded pole induction motors.

The Communications Devices and Applications Lab, headed by **Don Hummels** and **Fred Irons**, had a busy year in support of several projects. Currently, 5 graduate and 5 undergraduate students are involved with ongoing CDAL research efforts. As mentioned in the last Newsletter, an Army/DEPSCoR $334K contract has recently upgraded the UHF Test Facility so that analog to digital converters can now be tested for sampling performance into the GigaSamples per Second range. A lot of work has gone into interfacing the new instruments to control and run standard tests through our new DEC Alpha workstations. Basic new equipment includes two frequency synthesizers and three analyzers: logic, network, and spectrum. It is planned to make the test bed available to Maine industry to support the test and characterization of components so that this resource can be shared.

The ARPA HBT/ADC test support program is scheduled to run through FY97. Interesting work involves development of methods for characterizing and testing high speed samplers. Graduate students are looking at both folding and delta-sigma architectures. Another is looking at how compensation methods can be used to correct differential as well as integral nonlinearities through the use of histograms rather than the data intensive methods that have been used in the past. A fourth student is building a PC controllable hardware system to demonstrate real-time compensation for ADCs. This is an outgrowth of a cooperative project with the Receivers Group at Lockheed Sanders in Nashua where we presented a one day workshop on UHF ADC calibration procedures last January. Sanders has since taken up their own calibration project and have made significant strides on their own. It is satisfying to see industry pick up these ideas and apply them to their projects. A fifth student has been instrumental in the development of a 1GHz probe for use in tuning ceramic cavities. They will be used by Control Devices (Standish, Maine) in the production of cellular phone transmitter/receivers. The ultimate goal is a production robot to provide tuning data to assist in automatic production of the filter assemblies. An undergraduate is helping develop software to carry out these measures and to display statistics in real time.

Work also continues on the DSP hardware/software project for NUWC. Don Hummels is working closely with our pioneer lab member, Shawn Kennedy, on fielding this system for collecting and processing data for ocean targeting and analysis experiments. Another DSP project is about to begin with Watson Technologies (Portland, Maine) for developing DSP techniques for cable television distribution.

Ryszard Lec, Research Professor in EE and Technical Leader of the Industrial Process Control Sensor program at the University of Maine, continues his research and educational efforts in the area of sensors. Three 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, development of an undergraduate sensor program was the focus; this resulted in two new courses and the Undergraduate Sensor Laboratory. In the third year, the graduate sensor program was developed. This fall Dr. Lec offered a new graduate course, "Recent Advances in Sensors." He invited speakers from academia, industry, national laboratories, small businesses, and speakers out of the country to give lectures on current sensor topics. This form of teaching brings a very valuable real-world experience to the classroom. Also novel teaching methods, such as inquiry-based labs, hands-on experience, and cooperative learning, are being developed to help a student build his/her competence and confidence. The sensor curriculum trains students in the theory, design, fabrication and testing of sensors. Typical student sensors projects include accelerometers, viscometers, pressure sensors, a diesel fuel quality sensor, strain sensors, and biosensors such as antigen-antibody sensors.

Dr. Lec provided assistance and expertise to Maine industry. In collaboration with Control Devices Inc., (Standish, Maine), he is developing an engine oil quality sensor. The target application of the sensor is an on-board inexpensive solid state electronic sensing device to signal the need for an oil change in an automobile. Another project, in collaboration with BIODE Inc. (Portland, Maine), involves the development of a DNA hybridization sensor based on the bulk acoustic sensing mechanism. This sensor may simplify significantly the usually very complicated and time consuming procedure of currently available commercial DNA probes. Also Dr. Lec started a collaboration with Dr. Bredenberg from the Maine Medical Center in Portland, Maine, focused on the development of an acoustic sensor system for the monitoring of the growth of aortic muscle cells. This effort relates to explaining why 40% of by-pass surgery fails after one year.

Dr. Lec continues his collaboration with other engineering departments on campus. An effort with Dr. Cacesse (Mechanical Engineering) focuses on the development of acoustic sensors for monitoring stresses and strains in mechanical constructions. With Dr. Pendse (Chemical Engineering), Dr. Lec is exploring the use of both acoustic and electromagnetic radiation for influencing the required properties of liquid media.

Mohamad Musavi has been very active in neural network and computer vision research in the past year. In continuation of his research at the USAF Rome Laboratory during the summers of 93-94, he received two contracts from the Air Force Office of Scientific Research (AFOSR) and Rome Laboratory to investigate and develop the technology for automatic image registration using digital terrain elevation data (DTED). Related to the same topic, he has also submitted a proposal to the DoD/EPSCoR Program and is one of the two principal investigators on a proposal by Northrop Grumman for analysis and commercialization of automatic image registration technology. In addition to the above activity, Mohamad also received a grant from the Maine Science and Technology Foundation (MSTF) to develop a neural network based system for vectorization of hard copy maps.

Mohamad continues his joint research with The Jackson Laboratory on the classification of mouse chromosomes. This research, initially supported by a grant from the MSTF, is currently supported by contracts from NSF and DOE/EPSCoR. Related to this topic, he is a member of the Human Genome Project and will receive equipment and an ISDN communication line for video teleconferencing between members of the Genome group. Departmental outreach programs may also use the equipment.

In other Maine industry related projects, Mohamad received contracts from S.D. Warren Company and NSF to conduct research and develop the technology for prediction of the pulp delignification factor in the digester process. The application module for the technology will be installed on S.D. Warren process control computers by Mid-February. Mohamad also completed and installed a three camera observation system in the Dexter Shoe Company during the summer of '95.

Mohamad is also collaborating with Dr. Hemant Pendse of Chemical Engineering to develop neural network technology for use in process control. His effort in this area is being funded by Armstrong World Industries.

One of his more important activities has been the development of a DOE/EPSCoR proposal entitled "Development of Intelligent Systems Expertise in Maine." This proposal is a three year project at a total cost of $1.2M with the first year, at $412K, approved to start in July of '96. This proposal, as briefly described elsewhere in this newsletter, will have profound impact on the State's educational and industrial infrastructure.

Mohamad is currently advising four graduate students and three undergraduate students.

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. Numerous visits were made to Bangor Hydro-Pacific's West Enfield hydro-electric plant. The plant is the subject of an interactive multimedia-based hydro-generation operation simulator being developed to augment Junior power systems labs. A World Wide Web page (http://www.eece.maine.edu/Power) was created to describe the project in detail.

A second portable data acquisition system is being designed and built. The remote systems will be linked together in a Linux-based network using slip connections. Linux is a public-domain, unix-variant operating system designed for Intel-based microprocessors. The systems will be used to continue gathering data on the load characteristics of Central Maine Power and other utility feeders. Work was completed on characterizing the transients associated with capacitor switching at Rockland Station, and real/reactive power response data to voltage regulator and load tap changer operations is being gathered.

Two power system studies are in progress - one for the University Facilities Management Department and one for Bangor Hydro-Electric. The goal of the University Facilities Management project is to perform a load survey and determine the system data needed to analyze power quality and capacity expansion needs. An objective of the Bangor Hydro study is to investigate phase voltage problems and ground wire current flow on a Hydro feeder having large load unbalance, high soil resistivity, and abnormally high current harmonics.

Work is continuing on the devleopment of a three phase distribution load flow program 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.

As part of preparation for the DOE-EPSCoR project described elsewhere in this newsletter, Jim has been working on Maine Science and Technology Foundation activities in support of the project. He served on a six member committee to formulate a proposal to NYNEX to provide training for K-12 teachers and librarians throughout the State in developing expertise and projects connecting K-12 students with University and other researchers. The $2.1 million proposal was approved by NYNEX and submitted to the Public Utilities Commission for approval. Their decision is pending. He is serving on the Maine Internet Education Consortium overseeing the project.

In addition, Jim is representing the University on the Education Network of Maine Academic Council, a group consisting of academic vice-presidents and faculty representatives from each campus in the University System. The purpose of the Council is to oversee and ensure the quality of ENM program offerings.

Bruce Segee continues to be active in teaching as well as the Instrumentation Research Laboratory. The Instrumentation Research Laboratory is dedicated to research, development, and education related to instrumentation. Areas of particular interest include fuzzy logic, neural networks, and hierarchical control systems.

Current laboratory endeavors include several major factory automation projects for Dexter Shoe Company. Two large projects have been sucessfully completed in their Milo and Dexter factories. Work is currently underway to build a more advanced system for their Newport factory that will allow neural networks and fuzzy logic to be used to enhance product flow through the factory. This system will also allow the use of a factory-wide database. Work is underway on a USDA-funded effort to develop a lumber mill communication system based on Echelon technology that will use existing power lines for communication. The ultimate goal is to develop instrumentation that is rugged, reliable, and intelligent, but that can be installed simply by plugging it into a wall outlet. Instrumentation such as this could be a significant benefit for a wide range of industries. NSF-sponsored research in using neural networks to calibrate arrays of gas sensors is in its third year. This work has led to several methods for training neural networks quickly and with a limited training set. It is believed that it will lead to a practical method of calibrating arrays of gas sensors, and that the results are applicable to a wide range of problems involving a small sample of training points in a high dimensional space. An internally sponsored program seeks to develop an assistive communication device for a child with several disabilities. The approach used is to develop a modular architecture that would greatly reduce the time necessary to design a device for a person with a different set of disabilities. Students completed the project as a senior project. Other participants in this work included high school students involved in the YSP and MERITS programs. Other work includes the design of a fail-safe pumping system for the Civil and Environmental Engineering Department, and the design of "Segee ball," a computer controlled skee-ball machine, developed as a class project in a course on industrial control and computer communication.

Bruce has continued to receive support from a variety of sources locally and nationally. Additionally, Bruce has worked with students supported by NSF Young Scholars Program, NSF Research Experiences for Undergraduates, UpwardBound, and other programs for high school and/or undergraduate students.

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, NASA, James River Paper Company, the BIODE Corporation, and Sensor Research and Development (SRD) Corporation.

Dr. Vetelino is on the organizing committee for the 1996 International Chemical Sensors meeting to be held in Washington, D.C., in July 1996. The two small businesses, namely, BIODE and SRD Corporation, which were incubated from the sensor research at the University of Maine, have recently been successful in obtaining several small business innovation (SBIR) grants from the National Science Foundation, Department of Energy, National Institute of Health, Department of the Army and the State of Maine. These companies employ former and current UMaine students on a part time or full time basis.

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. This award represents the fifteenth award Dr. Vetelino has received from NSF to support undergraduate students in research.

In Memoriam

Henry R. Butler (Nov. 8, 1898-April 19, 1995) graduated from the University of Maine in 1920 with a BSEE. He helped earn his way by working as school electrician. Upon graduating, he went to work for General Electric in Schenectady, NY, where he met his wife, Grace, who was a resident of Burnt Hills, NY. He was awarded eight patents for his creative work in the early development of radio and participated in the design of some of the first radio transmission stations. In 1929 he went to work for Wired Radio in Ampere, NJ, as Chief Engineer. In 1940 he joined ITT in Nutley, NJ, as Chief Engineer of Communication Products. He remained with ITT until he retired in 1963 when he was Associate Director of the Avionics Division.

Shortly after his retirement, he moved to Orono with Grace, his wife of 65 years when she passed away in 1988. He was very active in both University and Senior Alumni affairs as well as various church and other community affairs. In recognition for his contributions to the University, he received the block "M" Alumni Service Emblem Award. He was active in Boy Scouts for over 70 years and was Treasurer of the Orono Methodist Church for many years. He was also responsible for getting his friend Ray Boynton to design the bridge which connects the elder citizen housing with the senior center in Orono.

In collaboration with his three children, all UMaine graduates, he established the Henry R. and Grace V. Butler Professorship in EE in 1991. He did this because of his deep love for the University and his desire to help the Electrical Engineering Department maintain its standards of excellence and commitment to help and challenge future electrical and computer engineers. He even purchased a computer and became computer literate in his 80s, a feat which delighted but did not surprise his children. He had an insatiable curiosity and desire to live life to its fullest.

The ECE Department greatly appreciates Frank Butler's preparation of this memorium.

ALUMNI/AE WWW PAGE

By the time you receive this we should have an Alumni/ae page as a part of the Department's WWW site (see http://www.eece.maine.edu). Please check it out; it will allow you to easily add your name and information. If you don't have www access but would like to be added, please send your name, degree(s) and date(s) received, employer and position, and email address to John Field.

ALUMNI/AE NEWS

Karen Andersen '90 is living in Newburyport, MA and working at MIT Lincoln Lab in Bedford, MA. She is doing R&D for Air Traffic Control systems, concentrating on the same radars she became familiar with while working for the FAA. A current project involves a proof-of-concept presentation for a machine intelligence/expert system that will provide remote maintenance monitoring and improved fault isolation for one of the FAA's new radars. She is also contributing on several other related projects with which the Laboratory is involved. She thinks the Laboratory is a wonderful place and enjoys her work very much.

Ken Barnes '90 is living in Bowie, MD with his wife, Lisa Varney, who is also a '90 UMaine grad (Economics). They both received master's degrees from George Washington Univ. in '92 (Ken in EE, and Lisa in International Affairs). He is working for a NASA contractor, the Hammers Company (home page at http://www.hammers.com), doing software development for various satellite applications including small satellite control. Lisa works for Development Alternatives, Inc. out of Bethesda, doing consulting and project management for Eastern European agribusiness development. She's currently living short-term in Budapest. Ken is still playing golf, occasionally gets back to Maine, and spends a lot of his free time working on the house they just bought.

Greg Chamberland '89. Following graduation, Greg and his wife Parise lived in Easton, MA. He worked for the Foxboro Company as a development engineer, then as a controls application engineer/asst. project manager while his wife got her doctorate degree in optometry. In May 1994 they moved to Winthrop, ME. He is now working for PID Inc. as a control system engineer and his wife is practicing in Augusta and Lewiston.

Charles Cote '68 received his M. Sc. degree from Brigham Young University in CAD/CAM in 1984. Charles is employed by Larochelle & Assoc. in Lewiston, ME, and is an electrical engineering consultant. He has PE registration in Maine, New Hampshire, and Massachusetts. Charles' two sons, Tom and Carl, have BS degrees in Electrical Engineering. They are employed at Raytheon and Cabletron.

Mark Goodberlet MS '84, received his Ph.D. in Electrical Engineering from UMass, Amherst in 1990. He lives in Belchertown, MA and is working at Quadrant Engineering building microwave systems for remote sensing of the environment.

Kiafar Haghkerdar '84, is practicing dentistry in White River Junction, Vt. where he lives with his wife Lila, and his children Michael 8, and Jessica, 5. After graduating from Maine he attended Yale where he received his MSEE in 1984 with a concentration in digital signal processing. He received his DDS from Tufts School of Dental Medicine in 1991.

Mike Hankard '90 sent in the following: After graduation, I moved to Boston and went to work in the Noise Control Engineering group at Stone and Webster. For the first two years I worked on power related projects, taking noise measurements in the field and designing controls. I worked on Deer Island the third year; what a gas!

In the Spring of 1993, my wife Kathy (married in August 1990) and I quit our jobs, hiked across Europe, and then moved to the Boulder, Colorado, area. I started my own noise consulting business with some success. In May 1994, however, I opted for the steady paycheck and went to work for Air Sciences. I am responsible for marketing and performing noise control consulting services. I enjoy it very much.

Personally, I mountain bike year round in the Rockies. In the summer I like to rock climb and drink home-brew. Happy to hear from any 89 and 90 grads!

Mark Lade BS '89, MS '91 is an Electronics Engineer at the Naval Undersea Warfare Center in Newport, RI. He is currently involved in all phases of development from design to field testing of current undersea weapon sensors. He's also active in traveling, volleyball, alpine skiing, sky diving, and scuba diving. Welcomes visitors to Rhode Island. Give him a call!!!!

Robert Metcalf BS '91 MS '94, was married to Jennifer Merrill on July 15, 1995. They honeymooned in Hawaii and are now living in Amherst, NH. Rob works at Cabletron in Merrimack, NH and Jennifer works at House Beautiful in Milford, NH.

Stanley J. Miller '50 retired from McDonnell Douglas Electronic Systems Company in 1992 as Director, Advanced Technology Development. He was with MDESC for 15 years and had previous assignments as Program Manager for large radar programs, Chief Engineer for a major C3I program, and Director of a Radar, Sonar and Signal Processing Engineering Group. He spent two years in the Pentagon doing program mangement for the Navy and was at MIT Lincoln Laboratory for 20 years, first as a staff members and then as a group leader. He is now doing management and technical consulting.

Robert Plesset '81 and his wife Rochelle are the proud parents of Emilie Lauren Plesset. She was born on October 20, 1995. Robert is a Senior UNIX Technical Consultant at Fannie Mae in Washington, DC. They live in Potomac, MD.

Susan Goodeill Rice '86 and her husband Cal proudly announce the birth of their daughter, Alexis Nicole Rice. She was born on October 29, 1995. Sue is MIS Manager/Office Manager for Coastal Telco Services in Damariscotta, ME. She also is a member of the Department's Visiting Committee.

Dean J. Smith BS '89, MS '91 is an Electronics Engineer at the Naval Undersea Warfare Center (NUWC) in Newport, RI. His responsibilities include the design, development and implementation of underwater acoustic digital signal processing systems and associated processing algorithms for use by the Navy. He was selected by NUWC as the recipient of a long term training assignment. This has allowed him to pursue his doctorate at the University of Rhode Island. His dissertation work is signal processing in shallow water environments.

Willis Tompkins BS '63, MS '65 was awarded the Theo C. Pilkington Outstanding Educator Award from the Biomedical Engineering Division of the American Society for Engineering Education at ASEE's annual meeting this past June. Willis is Professor and Chair of Electrical and Computer Engineering at the

University of Wisconsin, Madison. He is a Fellow of the IEEE and the American Institute for Medical and Biological Engineering. He also is a member of the Department's Visiting Committee.

Malcom A. Young '58. Mac is enjoying retirement in Augusta, WV after 35 years at IBM. He is pursuing several hobbies and interests including taking care of a 30 acre place, woodworking, genealogy work, history reading, computer activities, traveling, and spending summers in Searsmont.

FACULTY PUBLICATIONS

(July 1994 to June 1995)

JOURNALS

R.O. Eason, S. Kamata, and E. Kawaguchi, "Depth-first coding for multivalued pictures using bit-plane decomposition," *IEEE Trans. on Communications*, vol. 43, no. 5, p. 1961. May 1995.

D.C. Hanselman and W.H. Peake, "Eddy-current effects in slot-bound conductors," *IEEE Proc. Electr. Power Appl.*, vol. 142, no. 2, March 1995.

D. M. Hummels, W. Ahmed, and M.T. Musavi, "Adaptive detection of small sinusoidal signals in non-gaussian noise using an RBF neural network," *IEEE Trans. on Neural Networks*, vol. 6, no. 1, Jan. 1995.

B.E. Segee and M.J. Carter, "Comparative fault tolerance of parallel distributed processing networks," *IEEE Trans. on Computers*, Nov. 1994.

J.F. Vetelino and J. Andle, "Acoustic wave biosensors," *Sensors and Actuators*, vol. 44, no. 3, p. 167-176, 1995.

J.F. Vetelino, M.D. Antonik, J.E. Schneider, E.L. Wittman, K. Snow, and R.J. Lad, "Microstructural effects in W03 gas sensing films," *Thin Solid Films*, 256 p.247-252, 1995

CONFERENCE PROCEEDINGS

D. Hummels, W. Ahmed, F. Irons, "Measurement of random sample time jitter for ADCs, " *Proc. IEEE Inter. Symposium on Circuits and Systems*, May 1995.

D. Hummels, M. Musavi, W. Ahmed, "Application of fast orthogonal search for the design of RBFNN," *Proc. IEEE Inter. Symposium on Circuits and Systems*, May 1995.

R.M. Lec, S.W. Bang, J.M. Genco, and J.C. Ransdell, "Acoustic emission chemical sensor for monitoring the kinetics of chemical reactions," *Proc. of The Fifth International Meeting on Chemical Sensors*, July 1994.

R. M.Lec, and W.V. Lepuschenko, "Acoustic wave homogeneous immunoassay, " *Proc. of The Fifth International Meeting on Chemical Sensors*, July 1994.

M. Musavi, M.T.Sinclair, M. Qiao, "Radial basis function neural network as predictive process control modeI," *Proc. IEEE Inter. Symposium on Circuits and Systems*, May 1995.

M. Musavi, D. Coughlin, M. Qiao, "Prediction of wood pulp kappa number with radial basis function neural network,"*Proc. IEEE Inter. Symposium on Circuits and Systems*, May 1995

J. Patton and J. Ilic, "Aggregate load parameter identification using general regression neural networks," *Proc. of the 1994 Canadian Conference on Electrical and Computer Engineering*, Sept. 1995.

B. Segee, J. Field, B. Littlefield, "Teaching computer architecture through simulation with hardware verification," *Inter. Conf. of Simulation in Eng. Education Proceedings*, Jan. 1995.

B. Segee and Rucinski "Class project: use a hardware description language to simulate, microprogram, and synthesize a working processor," *Inter. Conf. of Simulation in Eng. Education Proceedings*, Jan. 1995.

J.F. Vetelino, J. D. Galipeau, R.S. Falconer, J. C. Andle, E.L. Wittman and M.G. Schweyer, "Theory, design

and operation of a surface acoustic wave hydrogen sulfide microsensor," *Proc. of The Fifth International Meeting on Chemical Sensors,* July 1994.

J.F. Vetelino, J. D. Galipeau, D.J. Frankel, A. Gower, W. Bruehs, "Surface acoustic wave corrosion sensor," *Proc. of The Fifth International Meeting on Chemical Sensors,* July 1994.

J.F. Vetelino, J.C. Andle, J.T. Weaver, D. J. McAllister, "Selective acoustic plate mode DNA sensor." *Proc. of The Fifth International Meeting on Chemical Sensors,* July 1994.

J.F. Vetelino, E. Wittman, D.J. Frankel, K. Snow, P. Patterson, "Tungsten trioxide films for surface acoustic wave gas sensor applications," *Proc. of The Fifth International Meeting on Chemical Sensors,* July 1994.

S. Wolpert, M. Osborn, Anna O'Neill, "A VLSI-based system for localization of extracellular potentials," *IEEE Conf. Proc. of EMBS*, Nov. 1995.

S. Wolpert, "Models of cycles oscillation using VLSI-based neural elements," *IEEE Conf. Proc. of EMBS*, Nov. 1995.

S. Wolpert, A. Laffely, "A reliable neuromime representation of fatigue-based mutual inhibition," *IEEE Conf. Proc. of EMBS*, Nov. 1995.

BOOKS

Hanselman, Duane C. and B. Littlefield, tutorial section of *The Student Edition of MATLAB*, ver. 4, Prentice Hall, Inc.

Hanselman, Duane C., *MATLAB Tools for Control System Analysis and Design*, 2nd ed., Prentice-Hall, Inc.

Hanselman, Duane C. contributor to *Automatic Control Systems*, 7th ed., Prentice-Hall, Inc. by B.D. Kuo.

EXTERNAL FUNDING

The following is a list of external funding available for expenditure between July 1994 and June 1995. If you would like to know more about any of these grants please contact us.

Principal Investigators	Title	Sponsor	Amount
Beenfeldt, Eason	SST Prototype Machine	Dexter Shoe	20,500
Beenfeldt, Eason	SST II Sensor Development	Dexter Shoe	40,000
Eason, R	SST Software Enhancements	Dexter Shoe	5,000
Eason, R.	Hypothermia Sensor Development	Randy Jackson	500
Field, Beenfeldt	Engineering Experience for High School Students	NSF	44,334
Hanselman, D.	Graduate Stipend for Brushless Motor Drive Dev.	SMMA	2,000
Hummels, D.	Continuous Wave Ping Detection Algorithm Develop	NUWC	23,978
Hummels, Irons	Develop Multi-GHz Sampling Capability	Dept. of Army	111,637
Hummels, Irons	Cellular Telephone (with extension)	Motorola	16,230
Irons, Hummels	ADC Test Support Program	ARPA	127,287
Irons, Hummels	ADC Test Support Program	ONR	42,429
Lec, R.	Sensors Research Fund	BIODE	2,833
Lec, Vetelino	Integration of Sensors into the EE Curriculum	NSF	88,627

Musavi, M.	Classify Mouse Chromosomes	MSTF	20,000
Musavi, M.	Auto Extraction of Drainage Network	Rome Lab., Dept of AF	30,028
Musavi, M.	Auto Image Registration Using Digital Elevation Data	AFOSR	25,000
Musavi, M.	Classification of Mouse Chrom. Using Neural Networks	NSF	57,415
Musavi, M.	Three Camera Observation System	Dexter Shoe	12,411
Patton	Internships	Stetson/Haskell	7,610
Patton, J.	Power Engineering Research (PRA)	Various Industries	39,432
Patton, J.	Multimedia Power Systems Control and Sim Labware	NSF	45,847
Patton, J.	Power System Study	Facilities Mgmt-UMaine	5,800
Segee, B.	RIA: Application of NN to Gas Sensors	NSF	21,380
Segee, B.	Communication Methodology for Sawmills	USDA/NE Wood Resrch	24,525
Segee, B.	Middleton Lumber Automation	Middleton Lumber	12,600
Segee, B.	Dexter Milo Factory Automation	Dexter Shoe	10,000
Segee, B.	Automation of Dexter Pre-fit Area	Dexter Shoe	150,000
Segee, B.	Modular Assistive Dev. for Children with Disabilities	Public Service. Awards	6,000
Sheppard, N.	Student Work Projects	MITRE	7,000
Vetelino (20%)	Acquisition of Multi-User Thin Film Syn and Proc.	NSF	500,000
Vetelino, J.	Research Experience for Undergraduates	NSF	58,021
Vetelino, J.	Study of Corrosion in Metallic Copper	Champion International	2,250
Wolpert, S.	Exam of Neural Algorithm Using VLSI-Based Models	NSF	29,960
Wolpert, S.	MOSIS 1994-95	NSF	16,440
Total			$1,607,074

Alumni/ae 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 update form. If you prefer, send electronic mail to John Field, or send your information to us at:

ECE Department, 5708 Barrows Hall, UM, Orono ME 04469-5708

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.

Please include the following information:

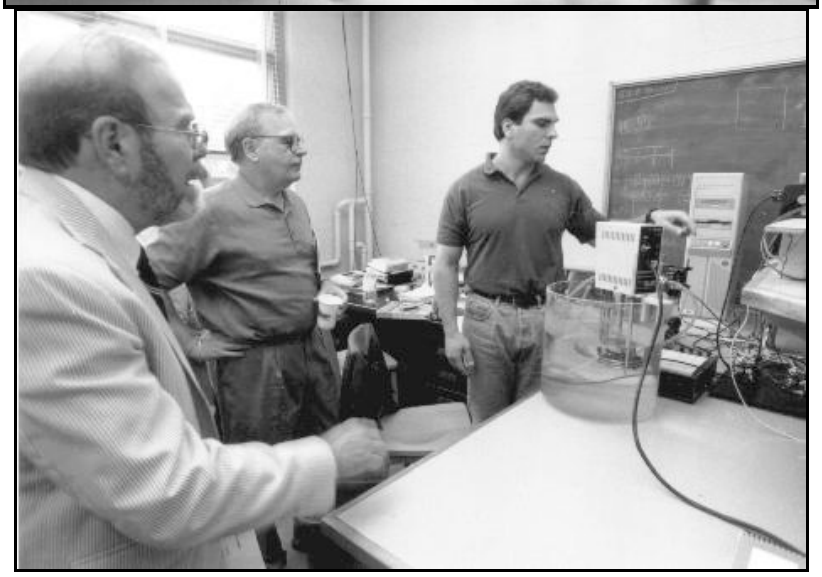
- Name
- UMaine Degree(s)/Year(s)
- Employer
- Position
- E-Mail Address
- WWW Home Page (if applicable)

Is it OK to put this information on our WWW Alumni/ae page?

Address Change?

News, Comments, Questions

Memories of the Centennial Celebration



Past and Present Faculty at the Centennial Celebration
3rd Row: J. Vetelino, W. Turner, C. Blake, J. Field, D. Hanselman, R. Eason, E. Beenfeldt, D. Hummels
2nd Row: R. Lowell, C. Brown, A. Whitney, W. Libby, L. Bowles, W. Tompkins
1st Row: B. Segee, F. Irons, R. Lec, N. Sheppard, J. Patton