



## Distinguished Alumni Gives Back 100 Fold



In 1960, The University of Maine gave a scholarship to Gerald M. Palmer to finish his education in the Electrical Engineering Department. Now, he has given back to the University 100 fold by establishing a scholarship fund, **The Gladys M. & Lloyd C. Palmer Fund**, in memory of his parents. In his induction to the Francis Crowe Society as the Electrical Engineering Distinguished Inductee this past December, Gerald (shown here with his wife, Evelyn) wrote:

*“Those small scholarships at that time were a huge lift to help me get through because I did not receive any other monetary help. I had a wife and three children to support. I have never forgotten that boost when I so needed it, and this is the primary reason for my starting the scholarship...”*

Gerald graduated from Bangor High School in 1946 and enrolled at the University of Maine in 1958 graduating with a BS degree in Electrical Engineering in 1961 with 160 semester hours of credits. He was also a member of Tau Beta Pi. After graduation, Mr. Palmer was employed with General Electric (GE) in Salem, Virginia. From the first day of work, Gerald showed his skills in both hands on work and his design ability and within one year, realizing the value of his work, the company moved him to higher offices to design control systems for GE clients.

Two years later, Gerald moved to Wellesley, Massachusetts as a field engineer assigned to all pulp and paper plants in Maine. After several years of working for the Wellesley plant and being stationed in Bangor, Maine he asked GE to open an office in Bangor. GE, not wanting to risk losing an extremely valuable employee opened a one-man engineering office in Bangor. Because of the profitability of Gerald's operations, they hired a new engineer for him, which eventually became 30 engineers and employees working for him. Then came the GE plant in Bangor and Gerald became the manager of the service shop. Later, he went on to become the zone manager for the entire Maine and New Hampshire operation that is one out of only 10 such zones in the nation. In 1987, Gerald's zone was recognized as the best performing zone in the nation.

Mr. Palmer completed at least eight GE company run training courses from 1962-1985 and taught many short training courses for entering GE engineers and GE customers. He became a Registered Professional Engineer in Massachusetts in January 1965 and in Maine in January 1971. He was a member of the IEEE Pulp and Paper Technical branch for many years, and attended many conferences. He spoke at a TAPPI conference and at an Empire State Spring conference in 1987. Mr. Palmer helped former Professor Walter Turner present a seminar on

Adjustable Speed Drives at UMaine in 1982 and taught a course on transformers at the Eastern Maine Vocational Training Center in Bangor.

In 1988, after 27 years with GE, Gerald retired. His work was mainly in installation and service engineering in paper and pulp mills and in utility power generating plants. While he worked mostly in Maine and New Hampshire, he also did work all over the US and in Sardinia, Italy.

Mr. Palmer has been very generous to the University of Maine making him a member of the Stillwater Society. He is a member of the "M" Club and supports UMaine football, Women's Basketball along with other sports. His generous support will continue his tradition of serving the community by providing scholarship assistance for many electrical and computer engineering students in perpetuity.

Gerald and his wife now live in Hermon, Maine. He has three children, two of which were UMaine alumni, Gerald Palmer, Jr., '70 and Catherine Palmer '72.

## **A Vision of Assisting Economic Development in Maine**

Enhancing the economic and educational opportunities and quality of life for rural people and their communities is a national priority. The socioeconomic vitality of rural America is linked to a number of key elements including a core set of demographic, educational, and economic forces that drastically lag those of the metropolitan areas. Nearly 50 million people live in rural areas over a vast expanse of America extending across 80 percent of the land. Rural median household income of \$37,564 is well below the metro median of \$48,474. With 42% of its population living in rural areas, Maine has the 11<sup>th</sup> highest rural population in America.

In today's dynamic global economy, developing an information access infrastructure throughout rural areas promotes economic development in a manner similar to the building of the Interstate Highway system. Affordable wireless and mobile communication systems are becoming the second digital revolution of our age after the Internet. Wireless system technologies have provided unparalleled opportunities in personal communications. Extending these technologies beyond their current boundaries and their integration with knowledge delivery networks enhances economic and educational opportunities of Mainers.

The Electrical and Computer Engineering Department is planning to build a core research and development infrastructure in Broadband Wireless access and Sensing (BWISE) through public-private partnerships involving the University of Maine universities, technical colleges, industrial partners, private organizations, municipalities, and government agencies. This effort will build on integrated system research and development in five core areas of: (1) wireless communications and microwave networks, (2) radio frequency based sensors and actuators, (3) micro/nano-electronic system integration, (4) cyber-infrastructure, and (5) intelligent information processing systems. The vision is to facilitate the deployment of broadband access throughout the entire state, especially in rural areas, and create innovative technologies for remote monitoring and management of the State's environmental resources, economic-driven factors, and public services.

The BWISE project will stimulate research and discoveries in many statewide disciplines such as oceanography, ecology, agriculture, forestry, aquaculture, and telemedicine. It will also foster new interdisciplinary collaborations to improve State competitiveness and increase its research capacity. Scientific challenges combined with the practical and economic-driven objectives will provide a sustainable research and development environment. Examples include assisting farmers to monitor and control their crops; identifying and preventing the spread of contagious diseases in animal husbandries; managing forest resources; monitoring drinking water, contamination in streams and reservoirs; real-time monitoring for bridge and highway maintenance; and safeguarding America's borders.

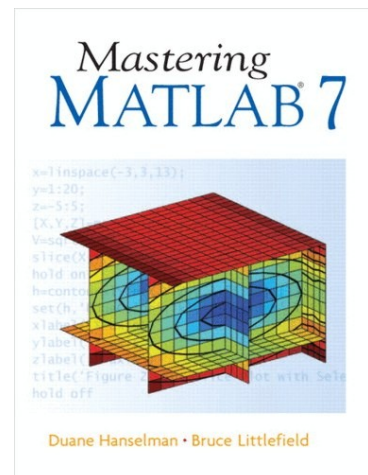
The BWISE project brings together small and large Maine businesses, State agencies and Universities to advance science and engineering, promote technology transfer and commercialization, and stimulate Maine's economy. Broadband wireless access, in itself, improves quality of life by enabling pervasive communication, online education, and remote health care. This will eventually results in increased population base, tourism, and small business development for Maine. Combining such an infrastructure with low cost and energy efficient intelligent wireless sensor networks will provide unprecedented spatial and temporal information, inspiring a knowledge-based economy.

To implement BWISE, the department is planning to compete for funding from State of Maine R&D Bond, National Science Foundation, USDA, and DHS, as well as seeking direct and in-kind support from participating organizations. We are also looking to our alumni for their guidance and help in this undertaking. Our alumni have long helped economic development through their productive work. Please write to us ([musavi@eece.maine.edu](mailto:musavi@eece.maine.edu)) and give us your opinion and help through providing equipment and other assistance for this project.

## Mastering MATLAB Book Crosses 100,000 Copy Threshold

Duane Hanselman (Associate Professor) and Bruce Littlefield (System Manager/Lecturer) are the coauthors of the Mastering MATLAB book series, with the current edition entitled *Mastering MATLAB 7*. Over the years since 1995 when the first edition became available, Duane and Bruce have sold just over 100,000 copies.

Their text is the standard desk reference trade book for the programming language MATLAB, which has been in existence since the early 1980s. Currently MATLAB is used by over a million engineers, scientists, and business professionals around the world.



The Mastering MATLAB book series came into being when Duane attended a MATLAB conference in 1994 that was sponsored by the makers of MATLAB, The Mathworks Inc. At that conference, Duane was approached by an acquisitions editor for Prentice-Hall, which was negotiating a contract with The Mathworks to sell *The Student Edition of MATLAB*. Prentice Hall

needed someone to write a tutorial for the User Guide text to accompany the software. The challenge presented was to write several hundred pages of tutorial in just eight weeks. In need of help to get that much done in so little time, Duane returned to UMaine and immediately talked to Bruce Littlefield, who was UMaine campus valedictorian in 1986. Duane knew Bruce could write well because he had just served on Bruce's master's thesis committee. Together, Duane and Bruce accepted the challenge to write the tutorial, under the condition that their work on the tutorial could be edited and augmented to become a stand alone trade book on the use of MATLAB. *The Student Edition of MATLAB* came out in 1995, and in 1996 *Mastering MATLAB: A Comprehensive Tutorial and Reference* was published.

Since the first edition, there have been three subsequent editions. Each were timed to appear shortly after major revisions of the MATLAB software, i.e., *Mastering MATLAB 5*, *Mastering MATLAB 6*, and most recently *Mastering MATLAB 7*. Various editions of the texts have been translated into Chinese, Korean, and Portuguese. The current American edition has 852 pages.

## Batteries Not Included



NASA is on a mission to fly wireless in space one day and Ali Abedi (l), Assistant Professor of Electrical and Computer Engineering, and Mauricio Pereira da Cunha (r), Associate Professor of Electrical and Computer Engineering are developing the technology they believe will help make that happen. The researchers are working on a new kind of battery-free wireless sensor communication system



that they say can perform in harsh environments where the battery-powered sensors now used in NASA'S space shuttle cannot function. News story: ([Real Media](#)) or ([Windows Media](#)).

The new sensor system will be used to monitor the shuttle engine and on the spacecraft's structure when reentering Earth's atmosphere. The system will also allow NASA to reduce the miles of bundled sensor wires and connectors that now add so much unwanted weight, expense and potential for failure to every space flight.

"The weight of all the wiring is a major issue for the space shuttle," says Abedi. "There are wired sensors everywhere in the space shuttle. All of them need batteries for power, but batteries explode in extremely hot temperatures and they don't work in very cold temperatures." "In addition," says Pereira da Cunha, "batteries add weight, increase the chances of system failure, and have limited life, thus requiring costly or non-feasible maintenance." Battery-free sensors, which require no maintenance, could also be embedded in the habitation domes being studied for a future moon colony for monitoring not only their structural health but also the environmental conditions. Power for the new system comes from a radio frequency signal that is transmitted to the sensors, which then beam it back with pertinent monitoring data.



“We can transmit the beam to hundreds of sensors at once to get all the combined data,” claims Abedi. Because the system is wireless, the sensor system can be moved out of the way when astronauts need room to make repairs on the space station. The sensor can then be easily reinstalled, like a standard plug-and-play computer device. The system will explore a novel integrated approach between wireless interrogation units and harsh environment sensors. The high temperature sensors will employ patented technology established in Pereira da Cunha’s laboratory. The project entitled, “Battery-Free Wireless Communication System for Harsh Environments,” is being funded by a three-year, \$360,483 grant from NASA.

Embedded sensors could also be effective in monitoring the health of bridges, buildings, dams, tunnels or other structures on Earth. The Maine Department of Transportation is interested in the new wireless communication design for use not only in bridges of the future but also in very old existing ones.

### **Maine IEEE Chapter Honored at luncheon in Washington DC**

The Maine IEEE Chapter (Prof. Ali Abedi), recently awarded the IEEE Communications Society (ComSoc) Chapter Achievement Award for North America, was one of four chapters honored at a luncheon on November 27, 2007 at the IEEE 2007 GLOBECOM Conference in Washington, D.C. Other chapters awarded were: Asia-Pacific: Taipei Chapter (Prof. Po-Ning Chen), Europe and Middle East: Turkey Chapter (Prof. Hakan Delic), and Latin America: Peru Chapter (Mr. Jorge Reyna). The award included a plaque and \$1000 honorariums and was presented to the chapter chairs during the luncheon.

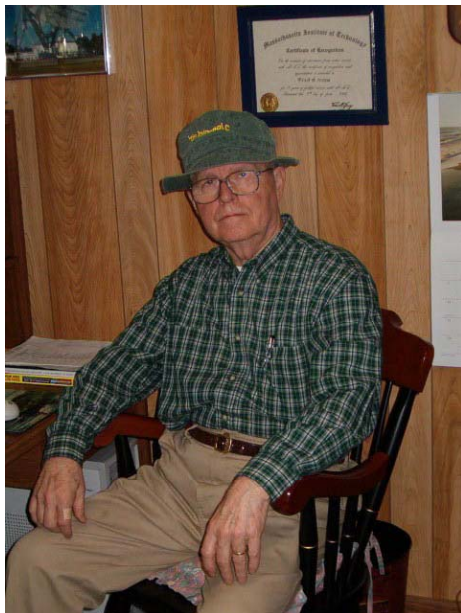


From left: J. Roberto B. de Marca (Chair, IEEE Award Committee), Nim K. Cheung (President, IEEE Communications Society), Byeong Gi Lee (VP Membership Development), **Ali Abedi (Chair, Maine Chapter)**, T. Scott Atkinson (Director, North America), Araceli Garcia Gomez (Director, Latin America), Daehyoung Hong (Director, Asia Pacific), Andrzej Jajszczyk (Director, Europe and Middle East), Po-Ning Chen (Chair, Taipei Chapter), Shri Goyal (Director, Membership Development).

President George Bush sent a letter extending his personal congratulations to the IEEE Global Communications Conference on its 50th anniversary celebration, citing the conference for its international achievement in the “development and advancement of global communications” as well as “promoting achievement and innovation in technology and engineering.” The landmark event was highlighted by more than 1,000 technical presentations exploring the latest developments in voice, data, image and multimedia communications.

“For five decades, IEEE’s Global Communications Conference has brought together engineers and professionals from around the globe to share ideas and new perspectives on a wide range of communications technologies”, noted the President. “Your important work helps ensure a better world for generations to come,” he observed.

## Retired Professor Keeps Busy Producing Books



Fred Irons is still hanging around the ECE department spending time producing books. In 2005, ArTech House published a book derived from the old filter course, ECE 441. It is not doing well in the US but has a steady “rest of the world” market according to the latest royalty report. Does that tell us anything? It is entitled: “Active Filters for Integrated Circuit Applications” and comes with a companion CD for all the examples and computer codes included in the text. It is now available at Amazon.com at a discounted price.

Last year Fred finally finished editing and compiling the infamous notes of ECE 210/211 into a single textbook. There were 780 hand drawn and cut-and-pasted figures to redo electronically and that is what took so long to complete the redo. The book is entitled: “Introduction to Electrical Circuits and Signals” and is also available at

Amazon.com at a textbook bargain price. It has 78 chapters, 876 pages, two appendices, and an index.

Other books Fred has worked on in recent years can be found at:  
[www.eece.maine.edu/~irons/books.html](http://www.eece.maine.edu/~irons/books.html).

Prof. Irons is trying to contact all of the 10 former Castle Students and has not found the following four. If you know of their whereabouts or how to contact them please send an email to him at: [fsmx@eece.maine.edu](mailto:fsmx@eece.maine.edu). The students missing are: Richard Doyon, John Larrabee, Shawn Upton, and Jeremy Ferris. Any help will be appreciated.

## **Gifts/Donations**

\$11,177 from Suzanne Tiemstra representing John Wentworth's estate to establish the John W. Wentworth Electrical Engineering Scholarship Fund.

\$10,000 from George and Catherine Sakellaris to ECE gift account.

\$10,000 from Kenneth & Gweneth Bach including a \$5,000 match from Electro Metrics to the ECE gift account and the following funds: Walter J. Creamer, Carlton M. Brown, Walter W. Turner and Allison Whitney.

\$5,000 from Shirley Palmer for the **Gladys M. and Lloyd C. Palmer Scholarship or Department Aid.**

\$5,000 with a total pledge for \$20,000 by Dale and Julia Flanders to endow **The Dale & Julia Flanders Engineering Leadership Scholarship Fund** for the ECE/MBA program.

\$2,000 from Carleton & Iris Brown to Carleton M. Brown Scholarship, Walter W. Turner Scholarship and Allison Whitney fund.

\$1,000 from Fred and Sally Irons to the Allison Whitney Fund.

## **Grants Received**

A. Abedi (PI 50%) and M. da Cunha (CoPI 50%), "Battery-Free Wireless Communication System for Harsh Environments," NASA, \$360,483 for 3 years, December 24, 2007

A. Abedi, (50%), V. Caccese (50%), "Maine Space Grant Consortium Fellowship and Scholarship Program," NASA, \$88,843 (12 months), January 1, 2008.

## **Publications**

### Peer Reviewed Journals

**A. Abedi**, A. K. Khandani, "A New Method for Performance Evaluation of Bit Decoding Algorithms Using Statistics of the Log Likelihood Ratio," Journal of the Franklin Institute, Vol. 345, No. 1, pp. 60-74, January 2008.

**Y. Zhu**, J. Hong, "RACE: A Robust Adaptive Caching Strategy for Buffer Cache, IEEE Transaction on Computers," Volume 57, Issue 1, pp. 25-40, January 2008.

## Other

Since December the faculty have submitted three proposals for a total of about \$2,126,000.