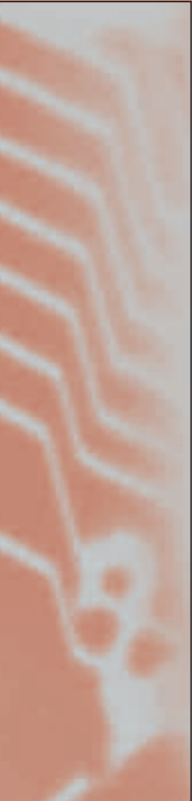
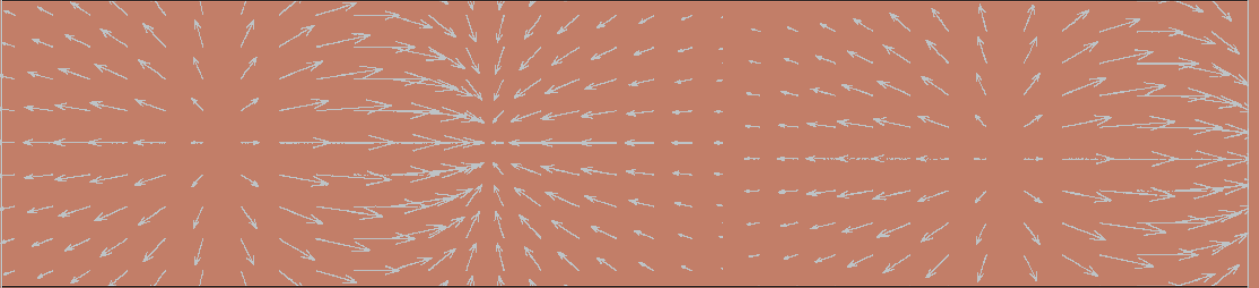




UNIVERSITY of
NEW ORLEANS

DEPARTMENT OF ELECTRICAL ENGINEERING

2002-2003 REPORT



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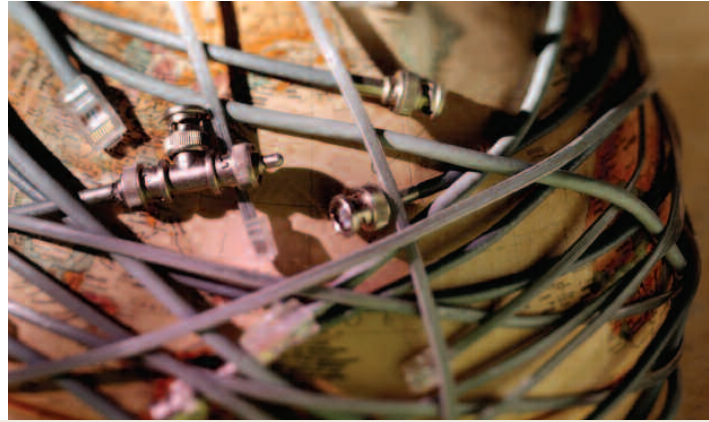
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CHAIRS' WELCOME AND INTRODUCTION

During 2002 and 2003 the University of New Orleans, its College of Engineering, and the Department of Electrical Engineering, experienced many changes that have already proven to be beneficial for the entire academic community, and have enormous further potential.

In recent years, the EE Department has been experiencing a transition from being teaching oriented to research oriented. Not only have our faculty and student body sizes increased significantly, but we have also improved quality of education, research productivity and recognition, as well as expanded our areas of expertise while developing and enhancing a core of focus areas for our research and graduate programs.

Five new promising junior faculty members joined the Department in the 2002-2003 period. They brought with them academic and industrial experience that complement each other as well as the Department's. Following our strategic plan, all new faculty specialize in our strong focus areas within either computer engineering or signals and systems. Particular new strengths are in reconfigurable computing, optical computing, wireless networks, embedded systems, and other Computer Engineering areas. The most notable enhancement is on data fusion and target information processing, a major research focus area of the Department.

Our new undergraduate Computer Engineering Concentration, officially approved in 2000, is in full swing, complementing the Electrical Engineering Concentration which has been in place for many years. Many new computer engineering courses, both at the undergraduate and graduate levels, have been developed, and have shown to be popular among our students. Three new labs have been established and are fully operational. We are actively developing stand-alone accredited undergraduate and graduate programs in Computer Engineering. This is fully supported by the administration and the State of Louisiana, as evidenced by the strong budgetary support we received from the Governor's Information Technology Initiative through the administration.

In the Fall of 2002 we had a very successful visit from our accreditation body, the Accreditation Board for Engineering and Technology (ABET). In related accreditation matters, we are now

working on our accreditation for the Southern Association of Colleges and Schools (SACS), which we expect to complete, again successfully, in 2005.

The Department continues to enjoy strong support and involvement from industry in the New Orleans area. We benefit from a very active Industry Advisory Board that contributes to our academic excellence by mentoring students, aiding us in defining and achieving our goals and objectives, and financially supporting scholarships, equipment funds, and capstone senior design projects, among other endeavors.

Our faculty, ranging from promising young assistant professors to world-renowned scholars, is committed to continued improvement in all areas relevant to academic excellence of the Department and profession. Given our committed, strong faculty, improved student body, and full support from the administration and external entities, we are confident that our research and educational programs will reach an even higher level in the near future.

During 2002-2003, there was a change in the leadership of both the College of Engineering and the EE Department. Dr. Russell E. Trahan, Jr., former Chair of the Department of Electrical Engineering, became Interim Dean of the College of Engineering in 2002, and then Dean in 2003. Dr. X. Rong Li and Dr. Edit Kaminsky Bourgeois became, respectively, Chair and Associate Chair of the EE Department. Dr. Richard Bishop, Professor of Electrical Engineering, first Chair of the EE Department, and a great contributor to the College as Associate Dean for many years, retired in 2003.

As part of the new vision for the Department, we have developed this report, covering the period 2002-2003. It presents a snapshot of the Department in 2002-2003, and highlights what we consider to be our major contributions and expectations for the near future.

Additional, updated information can be found at the Department's web site: <http://ece.engr.uno.edu/>. Please feel free to contact us for any other information.

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PROGRAM STATISTICS

Enrollment at the University of New Orleans exceeds 17,000 students. There has been a steady increase in enrollment in both undergraduate and graduate programs. The enrollment statistic at UNO for the last 5 years, depicted in **FIGURE 1**, shows an average of 2.1% annual increase in enrollment.

There has also been a marked increase in the enrollment in the College of Engineering, as seen in **FIGURE 2**. The statistics reflect an annual increase of 4.7%.

THE STUDENTS ENROLLED IN THE DEPARTMENT OF ELECTRICAL ENGINEERING REPRESENT 40% OF THE TOTAL STUDENTS ENROLLED IN THE COLLEGE OF ENGINEERING, WHICH CONSTITUTES THE HIGHEST LEVEL OF ENROLLMENT COMPARED TO ALL THE OTHER ENGINEERING DEPARTMENTS. THE DEPARTMENT HAS ALSO WITNESSED AN AVERAGE INCREASE OF 8.5%.

There has also been a marked increase in graduate enrollment at the university level, and the departmental level. Between 2000 and 2003, the average increase in graduate enrollment was 14.1% at the UNO level, 14.5% at the College of Engineering level, and a marked 23.8% in the Department of Electrical Engineering.

The Department currently maintains a graduation rate of at least 30 students per year. The Department has recently implemented policies to improve the quality of the programs that has resulted in a slight drop in graduation rate.

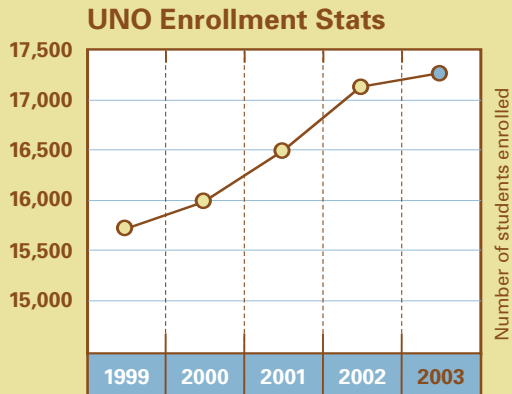


Figure 1

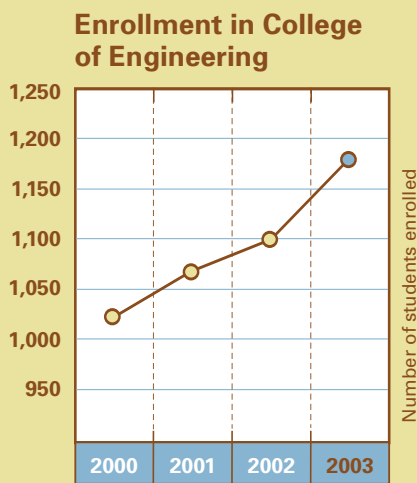
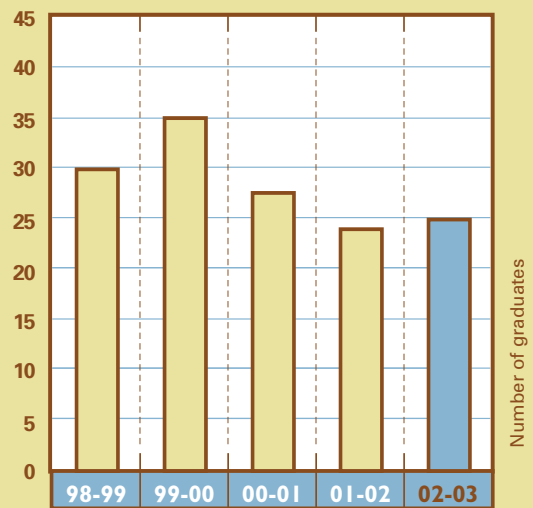
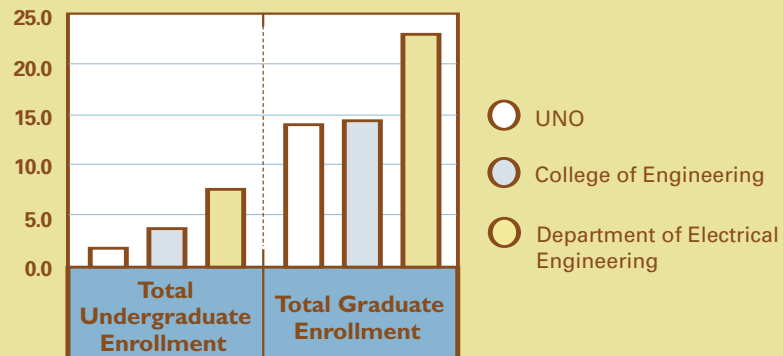


Figure 2

Graduates in Electrical Engineering



Enrollment Increase Percentage



FACULTY



Research Focus Areas

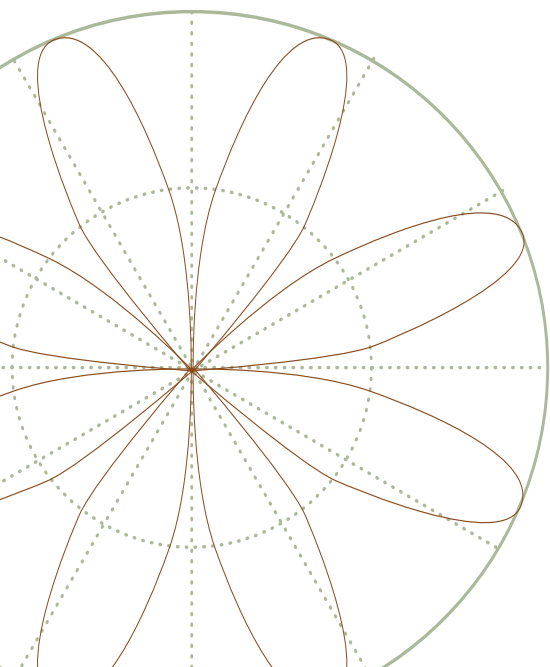
Information fusion and target tracking, detection, and recognition
Signal, image, and data processing
Optics and optical systems
Computing and communications

Faculty Expertise

Information fusion and target tracking, detection, and recognition
Signal and data processing (digital, statistical, optical, biomedical, radar, sonar, and audio)
Polarization, reflection, and thin-film optics; ellipsometry and polarimetry
Image processing (texture analysis, image compression, computer vision, and face recognition)
Communications (digital, wireless, and optical), sensor networks, error-correction and speech coding
Computing (reconfigurable, optical, and high performance), electronic design, embedded systems
Statistical inference, estimation, decision, filtering, identification, and forecasting
Control systems (stochastic systems, stability analysis, system identification), industrial control, and optimization
Neural networks, learning, pattern recognition, and computational intelligence
Sensors and sensor systems (fiber-optic sensors, radar and sonar systems), computational electromagnetics
Power systems, electrical machinery, and high-voltage engineering

Among the many accomplishments during the 2002-2003 period, one that we are particularly proud of, and excited about, is the addition of five new faculty members: Abdul Rahman Alsamman, Huimin Chen, Xin-Ming Huang, Vesselin Jilkov, and Jing Ma. These five individuals joined the Department of Electrical Engineering as Assistant Professors, bringing with them expertise in a variety of areas, a balance of academic and industrial experience, diversity in their background, and teaching interests in exciting electrical and computer engineering fields. Thanks to them, we now have expertise in areas such as reconfigurable computing, parallel computation, wireless networks, embedded systems, chip design, and optical computing. Drs. Chen and Jilkov have strengthened our focus on target detection and tracking, estimation theory, data fusion, and information theory.

A SUMMARY OF THE BACKGROUND INFORMATION ABOUT THESE FIVE NEW FACULTY FOLLOWS, WITH OTHER DETAILS GIVEN IN THE FACULTY SECTION OF THIS REPORT.



Dr. Abdul R. Alsamman earned his PhD in Electrical Engineering from the University of Alabama in the fall of 2001. His dissertation is entitled “Ultrafast Invariant Face Recognition.” He joined the EE Department in January 2002 as an Assistant Professor. Prior to that, he taught at the University of South Alabama. His area of expertise is in optical data processing and computing and his research has focused on using photonic processing for face recognition and image processing applications; statistical filter designs for optical correlators using synthetic discriminant functions and projection slice algorithms; optical correlator based neural networks; pose estimation model for face recognition; multiwavelet analysis using phase encoded optical correlators. His research interests also include optical processing, face and biometric identification, target tracking, and biomedical imaging. Currently, Dr. Alsamman is serving as the chair of the Computer Engineering Committee and is helping the Department of Electrical Engineering establish its Computer Engineering degree programs. Dr. Alsamman has been instrumental in building three new EE/CpE labs. He teaches Digital Design, VHDL, Microprocessor Interfacing, Advanced Computer System Design, Computer Architecture Lab, and Introduction to Optical Computing and Data Processing.

NEW FACULTY

Dr. Huimin Chen received the B.E. and M.E. degrees from Department of Automation, Tsinghua University, Beijing, P.R. China, in 1996 and 1998, respectively, and the Ph.D. degree from the Department of Electrical and Computer Engineering, University of Connecticut, Storrs, Connecticut, in May 2002, all in electrical engineering. He was a post-doctorate research associate at the Physics and Astronomy Department, University of California, Los Angeles, and a visiting researcher with the Department of Electrical and Computer Engineering, Carnegie Mellon University where his research focus was on weak signal detection for single electron spin microscopy. He joined our Department in January 2003 as an Assistant Professor. His research interests are in the general areas of signal processing, estimation theory, and information theory with applications to target detection and tracking and data fusion. He has published more than 20 refereed journal articles and conference proceedings papers.

Dr. Xin-Ming Huang joined the EE Department as an Assistant Professor in January 2003. Prior to that, he was a Member of Technical Staff at the wireless advanced technology laboratory, Bell Labs of Lucent Technologies. Dr. Huang was the recipient of the 2002 Central Bell Labs Annual Excellence Award. From 1996 to 1998, he was a system engineer with Hewlett-Packard Co. and GenRad Inc. where he conducted research on digital IC modeling and high-speed test technologies. His current research interests include wireless communication and sensor networks, reconfigurable computing and applications, embedded systems architecture and co-design techniques, VLSI signal processing algorithms, and high-speed digital testing techniques for ASIC verification. His teaching interests are in the areas of advanced computer architecture, HDL chip design, and wireless communications. He received a Ph.D. degree in Electrical Engineering from Virginia Tech in 2001.

Dr. Vesselin P. Jilkov received his B.S. and M.S. degrees in Mathematics (specialization "Operations Research") from the University of Sofia, Bulgaria in 1982, the Ph.D. degree in the Technical Sciences ("Electrical Engineering") in 1988, and the academic rank Senior Research Fellow (Associate Research Professor) of the Bulgarian Academy of Sciences in 1997. Dr. Jilkov was a Research Scientist with the R&D Institute of Special Electronics, Sofia, (1982-1988) where he was engaged in research and development of radar tracking systems. From 1988 to 1999 he was a Research Scientist with the Institute of Parallel Processing, Bulgarian Academy of Sciences, Sofia, where he worked as a key researcher in numerous academic and industry projects (Bulgarian and international) in the areas of applied estimation and Kalman filtering, target tracking, multi-sensor data fusion, and parallel processing. Dr. Jilkov joined the Department of Electrical Engineering, University of New Orleans in 1999 as a Visiting Research Scholar. From 2001 to 2003 he was a Visiting Assistant Research Professor and in August 2003 he was appointed regular Assistant Professor. During 2002-2003 he taught Probabilistic Methods of Signal and System Analysis, Advanced Random Variables and Stochastic Processes, Continuous and Discrete Signal and System Analysis, and Target Tracking. His current research interests are in the areas of stochastic systems (estimation, decision, nonlinear filtering, identification and adaptation), target tracking and recognition, and multi-sensor data fusion. Dr. Jilkov is author/coauthor of one book and more than 55 refereed journal articles and conference proceedings papers.

Dr. Jing Ma received her Ph.D. degree in Electrical Engineering from Virginia Polytechnic Institute and State University in January 2003, and her focused area was computer engineering. She received a Master of Engineering degree from National University of Singapore in 1998, and the M.S. and B.S. degrees from Northwestern Polytechnic University, Xian, P.R. China, in 1995 and 1993, respectively. Before she joined our EE Department as an Assistant Professor in 2003, she had a six-month internship at Bell Labs, Lucent Technologies. Her research interests are in reconfigurable architectures, reconfigurable computing applications in signal processing and communications, VLSI and electronic design automation algorithms, and dependable computing and fault tolerance. Her teaching interests include Digital Logic Design, Computer System Design, and Network Application Design. She is also working on developing new courses for the Computer Engineering Curriculum.





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M.S., 1984 ZHEJIANG UNIVERSITY, CHINA, ELECTRICAL ENGINEERING
B.S., 1982 ZHEJIANG UNIVERSITY, CHINA, ELECTRICAL ENGINEERING

Dr. X. R. Li, Fellow of IEEE, is an internationally recognized leading expert in information fusion and target tracking and, in an NSF panel of experts words, “*has made a groundbreaking contribution*” in these areas. He is the President of the International Society of Information Fusion (ISIF) since 2003. He has published four scholarly books, six book chapters, more than 170 refereed journal articles and conference proceedings papers; served as an Editor of the *IEEE Transactions on Aerospace and Electronic Systems* (1997–2003), an Associate Editor (1995–1996), and Editor of the *Communications in Information and Systems* since 2001; served as the General Chair and/or organizer of several international conferences and workshops; delivered plenary speeches in several international conferences and workshops; received a CAREER award and an RIA award from National Science Foundation (NSF); given more than 60 invited seminars and several short courses in America, Europe, Oceania, and Asia; appointed as a Guest Professor by several universities and the Chief Scientist of a research center for information fusion; served as the President of the Chinese Professionals Association in New Orleans since 2002 and as a Vice President during 1995–1996. Dr. Li is the principal investigator of 20 research projects with a total funding over \$2.5M from various federal and state government agencies and the private sector.

Dr. Li's main research interests are in the areas of Information and Systems. They include Estimation, Filtering, and Decision; Information Fusion; Target Tracking, Recognition, and Detection; Statistical Inference; Radar/Sonar Data and Signal Processing; Stochastic Systems; Statistical Signal Processing; Learning, Pattern Recognition, and Computational Intelligence; Adaptive Filtering; Fault Detection and Isolation. Dr. Li also has a strong background in Power Systems and High Voltage Engineering.

Selected Publications

Y. Bar-Shalom and X. R. Li, *Multitarget-Multisensor Tracking: Principles and Techniques*, YBS, Storrs, CT, 1995, 615 pages

X. R. Li and T. Solanky, “Applications of sequential tests to target tracking by multiple models,” N. Mukhopadhyay, S. Datta, S. Chatopadhyay, eds., *Applied Sequential Methodologies*, Chapter 12, Marcel Dekker, New York, 2003, pp. 219–247

X. R. Li, Y.-M. Zhu, J. Wang, and C.-Z. Han, “Optimal linear estimation fusion—part I: unified fusion rules,” *IEEE Transactions on Information Theory*, 49(9):2192–2208, September 2003

Y.-M. Zhu and X. R. Li, “Unified fusion rules for multi-hypothesis network decision systems,” *IEEE Trans. on Systems, Man, and Cybernetics—Part A: Systems and Humans*, 33(4):502–513, July 2003

J. Zhou, Y.-M. Zhu, X. R. Li, and Z.-S. You, “Variants of Greville formula with applications to exact recursive least squares,” *SIAM Journal on Matrix Analysis and Applications*, 24(1):150–164, 2002

X. R. Li and N. Li, “Integrated real-time estimation of clutter density for tracking,” *IEEE Transactions on Signal Processing*, 48(10):2797–2805, October 2000

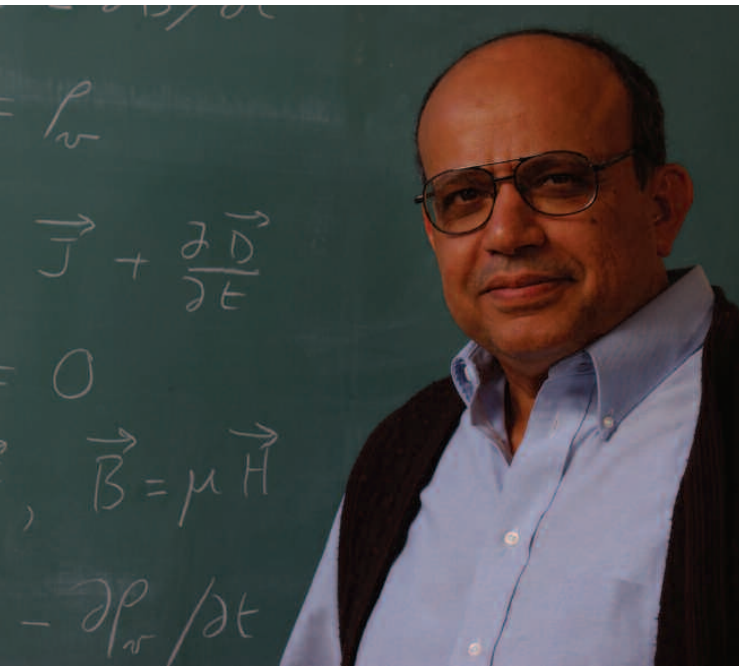
X. R. Li and Y. M. Zhang, “Multiple-model estimation with variable structure—part V: likely-model set algorithm,” *IEEE Transactions on Aerospace and Electronic Systems*, 36(2):448–466, April 2000

X. R. Li, “Tracking in clutter with strongest neighbor measurements—part I: theoretical analysis,” *IEEE Transactions on Automatic Control*, 43(11):1560–1578, November 1998

X. R. Li, “Hybrid estimation techniques,” C. T. Leondes, ed., *Control and Dynamic Systems: Advances in Theory and Applications*, Vol. 76, Academic Press, San Diego, 1996, pp. 213–287

X. R. Li and Y. Bar-Shalom, “Performance prediction of hybrid algorithms,” C. T. Leondes, ed., *Control and Dynamic Systems: Advances in Theory and Applications*, Vol. 72, Academic Press, San Diego, 1995, pp. 99–151

DISTINGUISHED FACULTY



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PH.D., 1971 UNIVERSITY OF NEBRASKA-LINCOLN, ELECTRICAL ENGINEERING
B. SC. (HONORS), 1967 CAIRO UNIVERSITY, EGYPT, ELECTRICAL ENGINEERING

Research Interests

Polarized light: its mathematical representations and physical measurement; Ellipsometry: its theory, instrumentation, and applications for the characterization of surfaces and thin films; Optical polarimetry based on reflective silicon detectors and diffraction gratings; Optics of thin films and design of optical devices for polarized light; Optics of anisotropic media and liquid crystals; Theory of reflection.

Honors, Distinctions, and Professional Service

Fellow of the Optical Society of America; Fellow of SPIE—The International Society for Optical Engineering; Fellow of TWAS—The Third World Academy of Sciences (Trieste, Italy); Fulbright Senior Research Scholar, Universit] de Provence, France; Citations for Outstanding Service by SPIE; Outstanding American Inventor (Intellectual Property Owners, Inc., Washington, D. C.); Photonics Circle of Excellence Award; R & D 100 Award; Topical Editor for *Journal of the Optical Society of America*, Topical Editor of *Applied Optics*; Chair of the Max Born Award Committee of the Optical Society of America; Organizer, Cochairman, and Proceedings Coeditor of several international conferences on ellipsometry, polarized light, and optical polarimetry; 5 U. S. Patents and many corresponding international patents; Successful technology transfer to 2 U. S. companies with millions of dollars worth of new products; Thousands of citations in more than 100 refereed science and engineering journals.

Selected Publications

Ellipsometry and Polarized Light (North Holland, Amsterdam, 1977) R.M.A. Azzam and N.M. Bashara, Authors. Reprinted in England, 1979. Translated into Russian and published by the Soviet Publishing House Mir, Moscow, 1981. Translated into Chinese, 1986. Paperback edition, 1987, 4th printing, 2003.

U.S. Patent No. 4,681,450, July 21, 1987, "Photodetector Arrangement for Measuring the State of Polarization of Light." This device was described as "among the most outstanding recent American inventions," by Donald W. Banner, former President of IPO, Inc., and former U.S. Commissioner of Patents and Trademarks. This invention has been featured in *Lasers and Applications* (September 1985), *Chemical and Engineering News* (July 13, 1987 & October 12, 1992), *Laser Focus World* (March, 1993), and in *The New York Times* (July 25, 1987), and other newspapers. Corresponding Japanese, Canadian, and European patents have been secured. Licensed to Gaertner Scientific Corp.

Selected Papers on Ellipsometry, SPIE Milestone Series (SPIE The International Society for Optical Engineering, Bellingham, Washington, 1991), R. M. A. Azzam, Editor.

Azzam, R. M. A., "Ellipsometry," Chap. 27 in *Handbook of Optics*, Vol. II, M. Bass, Editor-in-Chief, sponsored by the Optical Society of America (McGraw-Hill, New York, 1995).

Azzam, R. M. A. and Howlader, M. M. K., "Fourth- and Sixth-Order Polarization Aberrations of Antireflection-Coated Optical Surfaces," *Opt. Lett.* 26, 1607-1608 (2001).

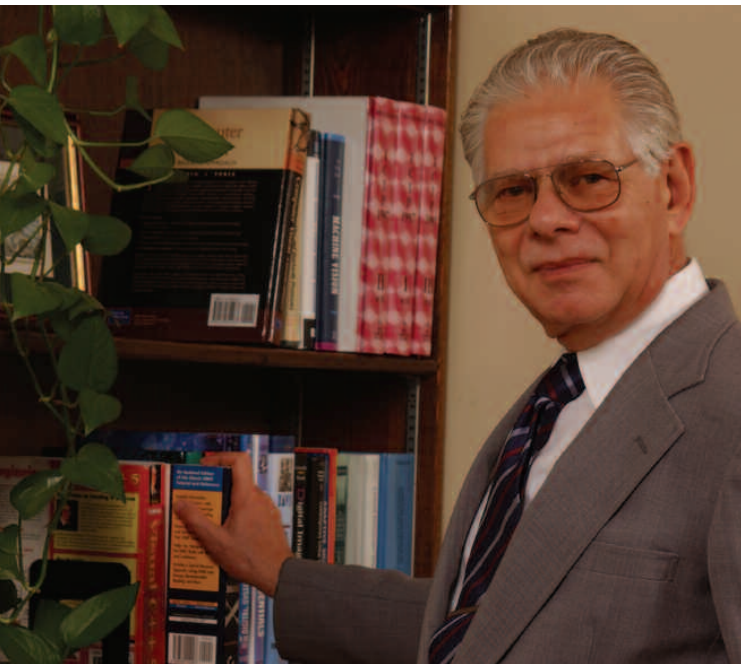
Azzam, R. M. A., and Mahmoud, F. A., "Symmetrically Coated Pellicle Beam Splitters for Dual Quarter-Wave Retardation in Reflection and Transmission," *Appl. Opt.* 41, 235-238 (2002).

Azzam, R. M. A., and De, A., "Circular Polarization Beam Splitter that Uses Frustrated Total Internal Reflection by an Embedded Symmetric Achiral Multilayer Coating," *Opt. Lett.* 28,355-357 (2003).

Krishnan, S, Hampton, S., Rix, J., Taylor, B., and Azzam, R. M. A., "Spectral Polarization Measurement by use of the Grating Division-of-Amplitude Photopolarimeter," *Appl. Opt.* 42, 1216-1227 (2003).

Azzam, R. M. A., and De, A., "Optimal Beam Splitters for the Division-of-Amplitude Photopolarimeter," *J. Opt. Soc. Am. A* 20, 955-958 (2003).

El-Saba, A. M., and Azzam, R. M. A., "Power, Efficiency, and Polarization Analysis of a Beamsplitter for the Equipartition of Infrared Input Power in the Presence of Angular, Film-Thickness, and Spectral Deviations," *Opt. Eng.* 42, 3487-3490 (2003).



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ENG. SC.D., 1956 NEW YORK UNIVERSITY
M.E.E., 1952 NEW YORK UNIVERSITY
B.E.E., 1950 NEW YORK UNIVERSITY

Research Interests

Dr. Chirlian research interests include effective bandwidth of signals and systems, where bandwidth is based on error in the transient response, and cryogenic electronics where research with Ph.D. students solved the problem of excess noise in analog cryotron amplifiers. Much of his research has been in the area of signal processing especially in the area of network and filter synthesis. Recently he has been working in the area of fiber-optic utilization in shipboard applications. This research resulted in a number of damage control sensors and a fiber-optic based device to measure torque and thrust. Dr Chirlian is dedicated to the education of students and most of his research has been conducted in conjunction with his Ph.D. students.

Dr Chirlian is the author of 28 textbooks many of which have been translated into a number of languages. These are in the areas of electronics, circuit theory, and computer languages. As PI or Co-PI he has received support of over \$2.5 million from various government agencies.

Honors, Distinctions, and Professional Service:

Fellow of the IEEE

Henry Morton Great Teacher Award, Stevens Institute of Technology

UNO National Alumni Association's Career Award for Excellence in Research

Member of Sigma Xi, Eta Kappa Nu and Tau Beta Pi

Selected Publications

Dr. Chirlian is the author of 28 books and over 70 research publications. Some representative ones are:

A Cryotron Linear Amplifier, IEEE Trans. on Component Parts, Vol. CP-10, pp. 144-146, Dec. 1963

The Cryotron as an Ultra Low Noise Amplifier - Elimination of Excessive Cryotron Noise," IEEE Trans. on Magnetics, Vol. MAG-2, pp. 390-393, 1966. Also presented at Integmag Conference, Stuttgart, Germany, April 1966, (Co-author: A.K. Johnson)

Restrictions Imposed Upon the Transient and Frequency Response of Networks," Quart. of Applied Math., Vol. 26, pp. 413-423, 1968

Restriction on the Effective Bandwidth of a Signal, IEEE Trans. on Circuit Theory, Vol. CT-18, pp. 422-425, 1971 (Co-author: C. Giardina)

Linear Phase Filter Design on a Time Domain Basis, Proc. IEEE, Vol. 69, pp. 836-837, 1981. (Co-author: B. Philobus).

An Analysis of Errors in Wave Digital Filters, IEEE Trans. on Circuits and Systems, Vol. CAS-28, pp. 154-160, 1981 (Co-author: D. VanHaften).

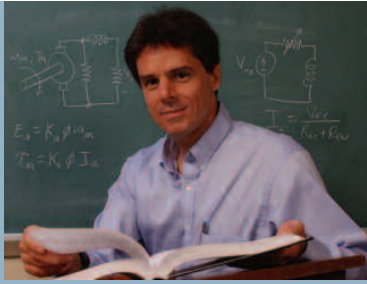
On The Effective Bandwidth of Sampled Signals, IEEE Trans. on Circuits and Systems, Vol. CAS-33, pp. 268-274, 1986, (Co-authors: C. Giardina and C. Suffel)

Bounds on The Effective Bandwidth of Two Dimensional Functions, Invited Paper - Twentieth Southeastern Symposium on System Theory, March 20-22, 1988, Charlotte, NC (Co-author C. Amirat)

On the Critical Point Detection of Digital Shapes, IEEE Transactions on Pattern Analysis and Machine Intelligence 17(8): 737-748, 1995, (Co-author P.Zhu)

A New Generalized Energy Criteria for the Passivity of Digital Networks, IEEE Transactions on Signal Processing, vol. 45 No. 8 1997 pp. 1909-1918 (Co-authors J. Bush and S. Basu)

FACULTY



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ENGINEERING (COMPUTER ENGINEERING)
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B.S., 1996 UNIVERSITY OF ALABAMA, ELECTRICAL ENGINEERING

Research Interests

Power System Modeling and Analysis, Electric Machinery, Protective Relaying, SCADA Systems, Power System Fault Detection, Real Time Data Acquisition and Control Systems, Engineering Design and Simulation Software Development.

Honors, Distinctions, and Professional Service

Mr. Alciatore received the UNO Dean's Student Organization Council Distinguished Teaching Award in 1992, 1995, and 2002. He was selected Teacher of the Year by the UNO Branch of IEEE in 1992, 1993, and 1994. He was listed in Who's Who Among America's Teachers 2004. He has served as faculty advisor at UNO for both the IEEE and Eta Kappa Nu student organizations. He is a Lifetime Member of Eta Kappa Nu electrical engineering honor society. He has been an active member in IEEE Power Engineering Society, IEEE Power Systems Relaying Committee, IEEE Industrial Electronics Society. He has been an active member of the New Orleans section of IEEE and has served as IEEE New Orleans Section Educational Activities Co-Chairman 1991-92, IEEE New Orleans Section Student Activities Chairman 1992-93, and IEEE Southeastcon'90 Registration Co-Chairman.

Research Interests

Dr. Alsamman's research interests include Optical Information Processing, Fiber Optic Sensors, Face Recognition, Biometric Identification, Target Tracking, Biomedical Imaging, and Image Processing, Satellite Communication.

Honors, Distinctions, and Professional Service:

He is a member of SPIE and a member of IEEE. He was also an invited speaker to Aerosense 2002. He is a co-inventor of a patent. His services at UNO include serving as an Engineering faculty senator and the chair of the Computer Engineering curriculum. He is helping the Department of Electrical Engineering establish its Computer Engineering degree programs. Dr. Alsamman has been instrumental in building three new EE/CpE labs.

Selected Publications (2002-2003)

- A. Alsamman and M. S. Alam, "Face Recognition Through Pose Estimation and Fringe-adjusted Joint Transform Correlation," *Journal of Optical Engineering*, Vol. 42, p. 560-567, 2002.
- A. Alsamman and M. S. Alam, "Face Recognition Using Fringe-adjusted Joint Transform Correlator Based Neural Network," *Journal of Optical Engineering*, Vol. 41, pp. 2768-2777, 2002.
- A. Alsamman and M. S. Alam, "Invariant Face Recognition Using a Projection Slice Synthetic Discriminant Function Based Algorithm," *Journal of Optical Engineering*, Vol. 41, p. 87-93, 2002.



Edit J. Kaminsky Bourgeois

ASSOCIATE PROFESSOR AND ASSOCIATE CHAIR OF THE DEPARTMENT

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PH.D., 1991 TULANE UNIVERSITY, ELECTRICAL ENGINEERING
M.S., 1987 TULANE UNIVERSITY, ELECTRICAL ENGINEERING
B.S., 1986 SUMMA CUM LAUDE, UNIVERSIDAD AUTÓNOMA DE CENTRO AMÉRICA, COLEGIO STUDIUM GENERALE COSTARRICENSE, SAN JOSÉ, COSTA RICA, ELECTRICAL ENGINEERING

Research Interests

Dr. Bourgeois's general areas of interest are digital communication systems, modulation and coding, underwater acoustics, remote sensing, neural networks, fuzzy systems, and signal processing. Of particular interest recently are underwater communications, multidimensional trellis coding, and applications of neural networks to decoding and ocean sediment classification.

Honors, Distinctions, and Professional Service

Dr. Bourgeois received the IEEE Edward R. Freitag Award in recognition of service to Section, technical achievements, and service to the profession in December 2003. She was selected Teacher of the Year by the UNO Branch of the IEEE in 2003 and 1997, and by Tau Beta Pi in 1998. She also received the DSOC Distinguished Teaching Award in 2000 and 1997 and is listed in Who's Who in Engineering Education, 2002 and Who's Who of Professionals, 2001. Dr. Bourgeois was an ASEE Summer Faculty Fellow in 2001 and 2002. She is currently the Chair of the New Orleans Section of the IEEE, and served as Vice-Chair and Secretary in 2002-2003; she has also served as member of many IEEE conference committees. She is a member of Tau Beta Pi and Eta Kappa Nu.

Selected Publications (2002-2003)

Kaminsky, E. J., and N. Deshpande, "TCM Decoding using Neural Networks," *Engineering Applications of Artificial Intelligence*, Vol 16, no. 5-6, Aug.-Sept., 2003, pp. 473-489.

Kaminsky, E. J., J. Ayo, and K. V. Cartwright, "TCM Without Constellation Expansion Penalty", *IKCS/IEEE Journal of Communications and Networks*, Vol. 4, No. 2, June 2002, pp. 90-96.

Kaminsky, E. J., and F. Douglas, "A Fuzzy-Neural Highly Accurate Cost Estimating Model (HACEM)", CIEF'2003 Conf. (3rd. int. workshop on Computational Intelligence in Economics and Finance), Cary, NC, Sept. 26-30, 2003, pp. 1035-1039.

Kaminsky, E. J. and J. Ayo, "TCM Without Expansion Penalty over Rayleigh Fading Channels," in *IEEE/TRLabs Wireless 2002 Proc.*, 14th annual internat. conf. on wireless communications, Calgary, Canada, July 8-10, 2002, Vol 1, pp. 131-139.



Carmen C. Canavier

ASSOCIATE PROFESSOR

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PH.D., 1991 RICE UNIVERSITY, ELECTRICAL AND COMPUTER ENGINEERING,
M.S., 1989 RICE UNIVERSITY, ELECTRICAL AND COMPUTER ENGINEERING,
B.E., 1979 VANDERBILT UNIVERSITY, CHEMICAL ENGINEERING

Research Interests

The neural basis of behavior at the level of the single cell: non-linear dynamics of neural oscillators and networks of oscillators.

Honors, Distinctions, and Professional Service:

She has 22 publications in peer-reviewed journals as well as numerous book chapters, proceedings and abstracts. She has been PI or Co-PI of six research projects with a total funding over \$1.5M.

Member of the Editorial Board of the Journal of Neurophysiology since July 2003.

Permanent member of NINDS study section NSD-C since Jan 1, 2003. Served as an ad hoc member of the Center for Scientific Review (NIH) IFCN-8 study section and on numerous NSF panels including the panels on Behavioral, Neuroendocrine and Computational Neuroscience and on Collaborative Research in Computational Neuroscience, and on the NSF Biomedical Engineering Advisory Committee.

IEEE Judith A. Resnik Award Committee May 2003-May 2005

Regular Member, Society for Neuroscience and the Institute of Electrical and Electronics Engineers (IEEE).

Selected Publications

Baxter, D.A., Canavier, C.C., and Byrne, J.H. Dynamical properties of excitable membranes. In *From Molecules to Networks: Cellular and Molecular Neuroscience*, John H. Byrne and James Roberts, eds., Academic Press, San Diego, pp.161-278, 2004.

Luo, C., Canavier, C.C., Baxter, D.A., Byrne, J.H. and Clark, J.W. Multimodal Behavior in a Four Neuron Ring Circuit: Mode Switching. *IEEE Transactions on Biomedical Engineering*, 51:205-218, 2004.

Komendantov, A.O., Komendantova, O.G., Johnson, S.W. and Canavier C.C. A Modeling study suggests complementary roles for GABAA and NMDA receptors and the SK channel in regulating the firing pattern in midbrain dopamine neurons. *Journal of Neurophysiology*, 91: 346-357, 2004.

Oprisan, SA, Thirumalai, V., and Canavier, CC. Dynamics from a time series: Can we extract the phase resetting curve from a time series? *Biophysical J.*, 84:2919-2928, 2003.

Oprisan, S.A. and Canavier, C.C. The influence of the limit cycle topology on phase resetting curve. *Neural Computation*, 14:1027-1057, 2002.

FACULTY



Dimitrios Charalampidis

ASSISTANT PROFESSOR

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PH.D., 2001 UNIVERSITY OF CENTRAL FLORIDA, ELECTRICAL ENGINEERING
M.S., 1998 UNIVERSITY OF CENTRAL FLORIDA, ELECTRICAL ENGINEERING
DIPLOMA IN ELECTRICAL ENGINEERING AND COMPUTER TECHNOLOGY,
UNIVERSITY OF PATRAS, GREECE, JULY 1996

Research Interests

Dimitrios Charalampidis' research interests are in image and signal processing applications, and pattern recognition—including texture analysis and synthesis, signal processing applications in remote sensing, image compression, speech coding, and neural networks.

Honors, Distinctions, and Professional Service

During 2002-2003 Dimitrios Charalampidis served as a Finance Chair for the 5th International Conference of Information Fusion that took place in Washington, DC, in July 2002. Furthermore, he has been the reviewer for several journals including IEEE Transactions on Neural Networks, IEEE Transactions on Image Processing, and IEEE Transactions on Remote Sensing. Moreover, he received the Dean's student organization council distinguished teaching award as an Assistant Professor in May 2003.

Selected Publications

D. Charalampidis and T. Kasparis, "Wavelet-based rotational invariant segmentation and classification of textural images using directional roughness features", IEEE Transactions on Image Processing, Vol. 11, No.8, pp. 825-836, August 2002.

D. Charalampidis, T. Kasparis, and L. Jones, "Multifractal and intensity measures for the removal of non-precipitation echoes from weather radars", IEEE Transactions on Geoscience and Remote Sensing, Vol.40, No.5, pp. 1121-1131, May 2002.



Huimin Chen

ASSISTANT PROFESSOR

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PH.D., 2002 UNIVERSITY OF CONNECTICUT, ELECTRICAL AND
COMPUTER ENGINEERING
M.E., 1998 TSINGHUA UNIVERSITY, BEIJING, CHINA, DEPARTMENT
OF AUTOMATION
B.E., 1996 TSINGHUA UNIVERSITY, BEIJING, CHINA, DEPARTMENT
OF AUTOMATION

Research Interests

Dr. Chen's research interests are in general areas of signal processing, estimation theory, and information fusion with applications to target detection and target tracking.

Honors, Distinctions, and Professional Service:

Faculty initiative for technology and teaching (FITT) award, Spring 2003, Univ. of New Orleans; Post doctorate research associate at Physics and Astronomy Department, University of California, Los Angeles, and a visiting researcher with the Department of Electrical and Computer Engineering, Carnegie Mellon University from July to Dec. 2002; Reviewer for Automatica since 2003, IEEE Trans. System, Man and Cybernetics since 2002, IEEE Trans. Aerospace and Electronic Systems since 2001.

Selected Publications

Dr. Chen has published more than 20 papers in refereed journals and conference proceedings.

H. Chen, Y. Bar-Shalom, K. R. Pattipati, and T. Kirubarajan, "MDL Approach for Multiple Low Observable Track Initiation", IEEE Trans. Aerospace and Electronic Systems, 39(3), July 2003, pp. 862-882.

H. Chen, T. Kirubarajan, and Y. Bar-Shalom, "Performance Limits of Track-to-Track Fusion vs. Centralized Estimation: Theory and Application", IEEE Trans. Aerospace and Electronic Systems, 39(2), Apr. 2003, pp. 386-400.

T. Kirubarajan, H. Chen, and Y. Bar-Shalom, "Parameter Estimation and the CRLB with Uncertain Origin Measurements", Methodology and Computing in Applied Probability, 3(4), Dec. 2001, pp. 387-410.

H. Chen, and Y. Li, "Intelligent flow Control Under Game Theoretic Framework", in Telecommunications Optimization: Heuristic and Adaptive Techniques, David W. Corne, George D. Smith, and Martin J. Oats (Eds), Wiley, 2000.



Hai Deng

ASSISTANT PROFESSOR

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PH.D., 2000 UNIVERSITY OF TEXAS AT AUSTIN, ELECTRICAL ENGINEERING
M.S., 1990 BEIJING INSTITUTE OF TECHNOLOGY, CHINA, ELECTRICAL ENGINEERING
B.S., 1987 ANHUI UNIVERSITY, CHINA, ELECTRICAL ENGINEERING

Research Interests

Signal Processing, Radar and Communications Systems, Computational Electromagnetics, and VLSI Design.

Honors, Distinctions, and Professional Service

Dr. Deng is one of the leading researchers in Orthogonal Netted Radar System (ONRS) and wavelet/packet based computational electromagnetics. Recently he was awarded a three-year research grant in sensor signal processing by the US Department of Air Force. Dr. Deng was a finalist for the IEEE R.W.P. King Award in 2003. He received the Academic Achievement Award at the University of Texas at Austin in 1999. From 1990 to 1996 Dr. Deng was the recipient of the Chinese National Science and Technology Progress Awards four times for "his outstanding contributions to the design and development of advanced radar signal processing systems." He is a senior member of the IEEE.

Selected Publications

H. Deng, "Polyphase coding signal design for orthogonal netted radar systems," To appear in IEEE Transactions on Signal Processing (in press)

H. Deng, "Discrete-frequency coding waveform design for netted radar systems," IEEE Signal Processing Letters, vol.11, pp. 179-182, no. 2, February 2004

H. Deng, "Effective CLEAN algorithms for performance-enhanced binary coding signal detection," IEEE Transactions on Signal Processing, vol. 52, pp. 72-78, no.1, January 2004.

H. Deng and H. Ling, "An efficient wavelet preconditioner for iterative solution of three-dimensional electromagnetic integral equations." IEEE Transactions on Antennas and Propagation, vol. 51, pp.654-660, no. 2, March 2003.

H. Deng and H. Ling, "An efficient preconditioner for electromagnetic integral equations using pre-defined wavelet packet basis." IEEE Transactions on Antennas and Propagation. vol. 50, pp.1633-1640, no. 11, Nov. 2002.



Xin-Ming Huang

ASSISTANT PROFESSOR

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PH.D., 2001 VIRGINIA TECH, ELECTRICAL ENGINEERING
M.S., 1997 NORTHWESTERN POLYTECHNIC UNIVERSITY, CHINA, ELECTRICAL ENGINEERING
B.S., 1994 NORTHWESTERN POLYTECHNIC UNIVERSITY, CHINA, INDUSTRIAL AUTOMATION

Research Interests

Dr. Huang's current research interests include wireless communication and sensor networks, reconfigurable computing and applications, embedded systems architecture and co-design techniques, VLSI signal processing algorithms, and high-speed digital testing techniques for ASIC verification.

Honors, Distinctions, and Professional Service:

Dr. Huang received the Faculty Initiative for Technology in Teaching Award of University of New Orleans in 2003. Prior to join the UNO faculty in January 2003, he was a Member of Technical Staff at Bell Labs of Lucent Technologies. He was the recipient of the 2002 Central Bell Labs Annual Excellence Award. He has three pending patents and was a reviewer for IEEE Transactions on Wireless Communication, WCNC, DAC, ERSA, and NATW conferences. He is a member of IEEE and Communication Society.

Selected Publications

X. Huang, W. Baumann, "Reduced-Order Modeling of Dynamic Heat Release for Thermoacoustic Instability Prediction", to appear in Combustion Science and Technology, accepted on February 2003.

X. M. Huang, J. Ma, Accelerate Multiphysics Modeling Using FPGA, Independent Component Analyses, Wavelets, Unsupervised Smart Sensors Neural Networks Conference, Proceeding of SPIE vol. 5439, April 2004.

X. M. Huang, J. Ma, Wireless Sensor Network for Streetlight Monitoring and Control, Digital Wireless Communication Conference, Proceedings of SPIE vol. 5440, April 2004.

J. Ma and X. M. Huang "Design and Implementation of a Real-time Image Noise Canceller", Visual Information Processing Conference, Processing of SPIE vol. 5438, April 2004.

FACULTY



Vesselin P. Jilkov

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B.S. AND M.S., 1982 UNIVERSITY OF SOFIA, BULGARIA, MATHEMATICS
(SPECIALIZATION OPERATIONS RESEARCH)

PH. D., 1988 BULGARIAN ACADEMY OF SCIENCES, SOFIA, TECHNICAL SCIENCES
(ELECTRICAL ENGINEERING)

SENIOR RESEARCH FELLOW OF THE BULGARIAN ACADEMY OF SCIENCES,
SOFIA, BULGARIA, 1997



Jing Ma

ASSISTANT PROFESSOR

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PH.D., 2003 VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

M.ENG., 1998 NATIONAL UNIVERSITY OF SINGAPORE, SINGAPORE

M.S., 1995 NORTHWESTERN POLYTECHNIC UNIVERSITY, P.R. CHINA

B.S., 1993 NORTHWESTERN POLYTECHNIC UNIVERSITY, P.R. CHINA

Research Interests

Dr. Jilkov's research interests are in the areas of Stochastic Systems (estimation, decision, nonlinear filtering, identification/adaptation, optimization), Target Information Processing (target tracking, detection, recognition, and multi-sensor data fusion), and Statistical Inference (estimation, decision, learning, Monte Carlo methods).

Honors, Distinctions, and Professional Service

Dr. Jilkov is a member of IEEE-Aerospace and Electronic Systems Society, SIAM (Society for Industrial and Applied Mathematics), ISIF (International Society of Information Fusion), and Phi Beta Delta (Honors Society for International Scholars). He also serves regularly as a reviewer for IEEE Transactions on AES, IEEE Transactions on AC, IEEE Transactions on ITS, IEE Proceedings, AIAA J. Guidance, Control and Dynamics. Prior to joining UNO Dr. Jilkov was a Senior Research Fellow of the Bulgarian Academy of Sciences, Sofia, Bulgaria (elected 1997) where he was engaged as a PI or key researcher in numerous Bulgarian and international projects with academia and industry in the areas of applied estimation, information fusion and target tracking systems (some with eventual practical implementation), including: Real-Time Stochastic Hybrid System Estimation (Bulgarian NSF Grant), and Parallel Kalman Filter for Tracking Maneuvering Targets, Multi-Sensor Data Fusion (ELTA Electronics Ltd., Israel Aircraft Industries).

Selected Publications

Overall Dr. Jilkov is author/coauthor of over 55 journal articles and conference papers, and one book.

V. P. Jilkov and X. R. Li, "Bayesian Estimation of Transition Probabilities for Markovian Jump Systems," IEEE Transactions on Signal Processing, Vol. 52, No. 6, 2004

X. R. Li and V. P. Jilkov, "Survey of Maneuvering Target Tracking, Part I: Dynamic Models," IEEE Transactions on Aerospace and Electronic Systems, Vol. 39, No. 4, 2003, pp. 1333 - 1364

V. P. Jilkov, D. S. Angelova, Tz. A. Semerdjiev, "Design and Comparison of Mode-Set Adaptive IMM Algorithms for Maneuvering Target Tracking," IEEE Transactions on Aerospace and Electronic Systems, Vol. 35, No. 1, 1999, pp. 343-350

X. R. Li, V. P. Jilkov and J.-F. Ru, "Expected-Mode Augmentation for Variable Structure Multiple-Model Estimation," Proc. 15th IFAC World Congress on Automatic Control, July 21-26, 2002, Barcelona, Spain

V. P. Jilkov, X. R. Li and L. Lu, "Performance Enhancement of IMM Estimation by Smoothing," Proc. 5th International Conf. on Information Fusion, July 8-11, 2002, Annapolis, Maryland, MD, USA, pp. 713-720

Research Interests

Reconfigurable architecture

Reconfigurable computing applications in signal processing and communications

VLSI and electronic design automation algorithms

Dependable computing and fault tolerance

Honors, Distinctions, and Professional Service:

Member of IEEE computer society

Organizer and assistant for the IEEE CAMP2003 & Xilinx

XUP Workshop, UNO, New Orleans, May 2003

Bell Lab co-op (May 2002 to November 2002)

Reviewer of IEEE Micro, IEEE/ACM Design Automation Conference, and WCNC

Selected Publications

J. Ma and X.M. Huang "Design and Implementation of a Real-time Image Noise Canceller", *SPIE Visual Information Processing Conference*, Processing of SPIE Vol.5438, April, 2004

J. Ma and P. Athanas "JBits-based Incremental Design Environment with Non-Preemptive Refinement for Million-Gate FPGAs", *International Conference on Engineering of Reconfigurable Systems and Algorithms*, pp118-124, June 23-26, 2003

J. Ma and P. Athanas "Incremental Design IDE for Million-Gate FPGAs", *the 6th International Conference on Engineering Design and Automation*, Aug 4-7, Hawaii, 2002

A.A. Kassim, M.A Mannan, and J. Ma, "Machine Tool Condition Monitoring Using Workpiece Surface Texture Analysis", *Machine Vision and Applications (USA)*, vol. 11, pp 257-263, 2000

M.A. Mannan, A. A. Kassim and J. Ma "Application of Image and Sound Analysis Techniques to Monitor the Condition of Cutting Tools " *Pattern Recognition Letters*, 21 (11) (2000) pp. 969-979



Terry E. Riemer

ASSOCIATE PROFESSOR

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PH.D., 1974 PURDUE UNIVERSITY, ELECTRICAL ENGINEERING
M.S., 1967 TULANE UNIVERSITY, ELECTRICAL ENGINEERING
B.S., 1965 TULANE UNIVERSITY, ELECTRICAL ENGINEERING



Russell E. Trahan, Jr.

CHEVRON USA PROFESSOR AND DEAN, COLLEGE OF ENGINEERING

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PH.D., 1977 UNIVERSITY OF CALIFORNIA, BERKELEY, ELECTRICAL ENGINEERING
M.S., 1973 UNIVERSITY OF NEW ORLEANS, ENGINEERING
B.S., 1970 UNIVERSITY OF NEW ORLEANS, ENGINEERING SCIENCES

Research Interests

Dr. Riemer's teaching and research interests include analog and digital electronics and bio-medical instrumentation, analog and digital communications, analog and digital audio engineering, digital audio signal processing, and digital bio-medical, image and signal processing.

Honors, Distinctions, and Professional Service

Selected for inclusion in the third edition of Who's Who Among America's Teachers, 1994; Selected for inclusion in the sixth edition of Who's Who Among America's Teachers, 1996; Selected as Teacher of the Year 2000 by the UNO Student Chapter of IEEE. Currently a member of the textbook technical review committee for Wiley, Inc., and McGraw-Hill in the areas of Digital Signal Processing, and Electronics. Current Projects include: Developing a high frequency acoustic translator for hearing impaired; and Electronic electroporation measurement and delivery systems for drug delivery. Recent Projects include: Developed the control and instrumentation systems for a multiple organ preservation system; Engaged in the development of a micro-computer based vehicle management system, including evaluation of battery and associated charging system components

Selected Publications

M. W. Losh, T. E. Riemer, and R. E. Trahan, Jr., "Level Independent Detection of Signal Saturation in Sensor Data", *Digital Signal Processing*, Vol.4, 1994, pp. 189-197.

B.-C. Jan, J. A. Henriquez, T. E. Riemer, and R. E. Trahan, Jr., "The Modified Window Correlation Technique for Estimation of Arbitrary Time Delays in Multi-channel Multi-event Systems", *Journal of The Acoustical Society of America*, Vol. 93, No.3, March, 1993, pp. 1466-1470.

M. Rog, M. W. Losh, T. E. Riemer, and R. E. Trahan, Jr., "Time Delay Estimation of Noisy Signals Using Spatial Amplitude Distribution Analysis", presented at 124th Meeting of the Acoustical Society of America, New Orleans, Louisiana, October 31 - November 4, 1992. Abstracted in the *Journal of The Acoustical Society of America*, Vol. 92, No. 4, Part 2, October, 1992, pp. 2323.

B.-C. Jan, J. A. Henriquez, T. E. Riemer, and R. E. Trahan, Jr., "The Focus Measurement Technique for Estimation of Arbitrary Time Delays in Multichannel, Multievent Systems", *Journal of The Acoustical Society of America*, November 1991, pp. 2480-2488.

Research Interests

Dr. Trahan's research interests over the past several years have primarily involved the application of sensors and data acquisition systems to ships and shipbuilding. The latest research project has involved the application of Light Detection and Ranging (LIDAR) in the shipbuilding industry. Three dimensional measurements of large ship structures have been demonstrated with LIDAR technology. Special software has been used to translate raw point cloud data obtained from a LIDAR system into usable drawings. Other projects have involved the development of fiber optics based shipboard sensors to measure parameters such as temperature, smoke, liquid level, and shaft torsion. Additionally, I have collaborated on a project to study the feasibility of using control surfaces to minimize the high impact slamming of planing boats.

Selected Publications

C. W. Alexander and R. E. Trahan, "A comparison of traditional and adaptive control strategies for systems with time delay," *ISA Transactions*, Vol. 40, No. 4, September, 2001. pp 353-368.

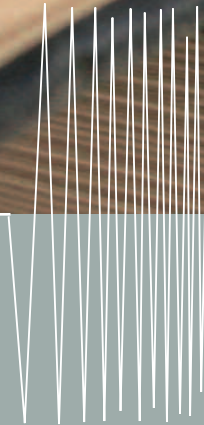
R. E. Trahan, et al, "Active Control of Planing Hull Motions-Final Report," Gulf Coast Region Maritime Technology Center Project No. AMTC99-311, January, 2003.

P. M. Chirlian, R. E. Trahan, and K. D. Jovanovich, "Fiber Bragg Grating Based Temperature Sensor-Final Report," Gulf Coast Region Maritime Technology Center Project No. AMTC97-145A, March, 2000.

R. E. Trahan, et al, "Light Detection and Ranging (LIDAR) Applications in Shipyards-Final Report," Gulf Coast Region Maritime Technology Center Project No. AMTC99-229, March, 2003.

T. Barbe, E. Kaminsky, R. E. Trahan, and P. M. Chirlian, An Iterative Fuzzy Classification Model for Diagnosing Coronary Artery Disease from Cardiac Stress Tests, IN-AI'2000 Conference Proceedings, Las Vegas, NV June 26-29, 2000 paper no. .421MS 118A

PUBLICATIONS



THE FOLLOWING IS THE RESEARCH PRODUCTIVITY RECORD
OF OUR CURRENT FACULTY

Books: 41

Book chapters: 15

Edited volumes: 5

Refereed journal articles: 404

Conference proceedings papers: 383

Patents: 5

Publication citations during 2000-2003 (ISI's SSCI Index): 5022

Faculty publications that appeared in 2002-2003 are listed below.

Abdul R. Alsamman

Journal Papers

Alsamman and M. S. Alam, "Face recognition through pose estimation and fringe-adjusted joint transform correlation," *Journal of Optical Engineering*, Vol 42, pp. 560-567, 2003

R. Alsamman and M. S. Alam, "Face Recognition Using Fringe-adjusted Joint Transform Correlator Based Neural Network," *Journal of Optical Engineering*, Vol. 41, 2002.

R. Alsamman and M. S. Alam, "Invariant Face Recognition Using a Projection Slice Synthetic Discriminant Function Based Algorithm," *Journal of Optical Engineering*, Vol. 41, p. 87-93, 2002.

Conference Proceedings Papers

Alsamman, "Optoelectronic-based face recognition versus electronic PCA-based face recognition," *Optical Information Systems, Proceedings of the SPIE*, Vol 5202, pp. 124-130 (2003).

Alsamman, "Ultra-fast multiwavelet analysis using phase-encoded JTC," *Wavelets: Applications in Signal and Image Processing X*, Vol 5207, pp. 916-922 (2003).

Alsamman and M. S. Alam, "Performance of invariant face recognition techniques," *Algorithms and Systems for Optical Information Processing VI, Proceedings of the SPIE*, Vol 4789, pp. 167-176 (2002).

R. Alsamman and M. S. Alam, "Face recognition through pose estimation and fringe-adjusted joint transform correlation," *Proc. of SPIE on Optical Pattern Recognition XIII Proc. Vol. 4734*, p. 23-34, 2002.

Rasheed Azzam

Journal Papers

Azzam, R. M. A., and Ugbo, E. E., "Angular Range for Reflection of p-Polarized Light at the Surface of an Absorbing Medium with Reflectance Below That at Normal Incidence", *J. Opt. Soc. Am. A* 19, 112-115 (2002).

Azzam, R. M. A., and Mahmoud, F. A., "Symmetrically Coated Pellicle Beam Splitters for Dual Quarter-Wave Retardation in Reflection and Transmission", *Appl. Opt.* 41, 235-238 (2002).

El-Saba, A. M. and Azzam, R. M. A., "Design and Analysis of Strip-Coated Parallel-Slab Beam Splitter for the Equipartition of Infrared Input Power", *Opt. Eng.* 41, 200-204 (2002).

Azzam, R. M. A., and De, A., "Circular Polarization Beam Splitter that Uses Frustrated Total Internal Reflection by an Embedded Symmetric Achiral Multilayer Coating," *Opt. Lett.* 28, 355-357 (2003).

Krishnan, S, Hampton, S., Rix, J., Taylor, B., and Azzam, R. M. A., "Spectral Polarization Measurement by use of the Grating Division-of-Amplitude Photopolarimeter," *Appl. Opt.* 42, 1216-1227 (2003).

Azzam, R. M. A., and De, A., "Optimal Beam Splitters for the Division-of-Amplitude Photopolarimeter," *J. Opt. Soc. Am. A* 20, 955-958 (2003).

El-Saba, A. M., and Azzam, R. M. A., "Power, Efficiency, and Polarization Analysis of a Beamsplitter for the Equipartition of Infrared Input Power in the Presence of Angular, Film-Thickness, and Spectral Deviations," *Opt. Eng.* 42, 3487-3490 (2003).

Conference Proceedings Papers

El-Saba, A. M., and Azzam, R. M. A., "Performance of Reflection Polarizers Using Bare Semiconductor Substrates in the Visible and Near-UV Spectrum," *Proc. SPIE* 4481, 1-9 (2002).

Howlader, M. M. K., and Azzam, R. M. A., "Negligible Polarization Aberrations of Antireflection-Coated Optical Systems," *Proc. SPIE* 4481, 58-63 (2002).

Edit J. Kaminsky Bourgeois

Journal Papers

Kaminsky, Edit J., and Nikhil Deshpande, "TCM Decoding using Neural Networks," *Engineering Applications of Artificial Intelligence*, Vol 16, no. 5-6, Aug.-Sept., 2003, pp. 473-489.

Kaminsky, Edit J., J. Ayo, and K. V. Cartwright, "TCM Without Constellation Expansion Penalty", *IKCS/IEEE Journal of Communications and Networks*, Vol. 4, No. 2, June 2002, pp. 90-96.

Conference Proceedings Papers

Kaminsky, E. J., and Freddie Douglas, "A Fuzzy-Neural Highly Accurate Cost Estimating Model (HACEM)", *CIEF'2003 Conf. (3rd. int. workshop on Computational Intelligence in Economics and Finance)*, Cary, NC, Sept. 26-30, 2003, pp. 1035-1039.

Kaminsky, E. J. and J. Ayo, "TCM Without Expansion Penalty over Rayleigh Fading Channels," in *IEEE/TRLabs Wireless 2002 Proc.*, 14th annual int. conf. on wireless communications, Calgary, Canada, July 8-10, 2002, Vol 1, pp. 131-139.

Carmen C. Canavier

Book Chapters

Canavier, C.C., Lovejoy L.P., and Shepard, P.D. Time Series Analyses of Spike Trains: Identifying Nonlinear Deterministic Structure, in *The Brain and Sensory Plasticity: Basic Science and Clinical Applications to Language Acquisition and Hearing*, edited by Charles Berlin and Ted Weyand, Singular Publishing Group, San Diego, pp. 43-56, 2003.

Canavier, C.C., Baxter, D.A. and Byrne, J.H. Repetitive firing of action potentials: a dynamic analysis. In: *Encyclopedia of Life Sciences*, Nature Publishing Group, London, 16:271-282, 2002.

Journal Papers

Oprisan, S.A. and Canavier, C.C. Stability analysis of entrainment by two periodic inputs with a fixed delay. *Neurocomputing*, 52-54:59-63, 2003.

Oprisan, SA, Thirumalai, V., and Canavier, CC. Dynamics from a time series: Can we extract the phase resetting curve from a time series? *Biophysical J.*, 84:2919-2928, 2003.

Oprisan, S.A. and Canavier, C.C. The influence of the limit cycle topology on phase resetting curve. *Neural Computation*, 14:1027-1057, 2002.

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Conference Papers

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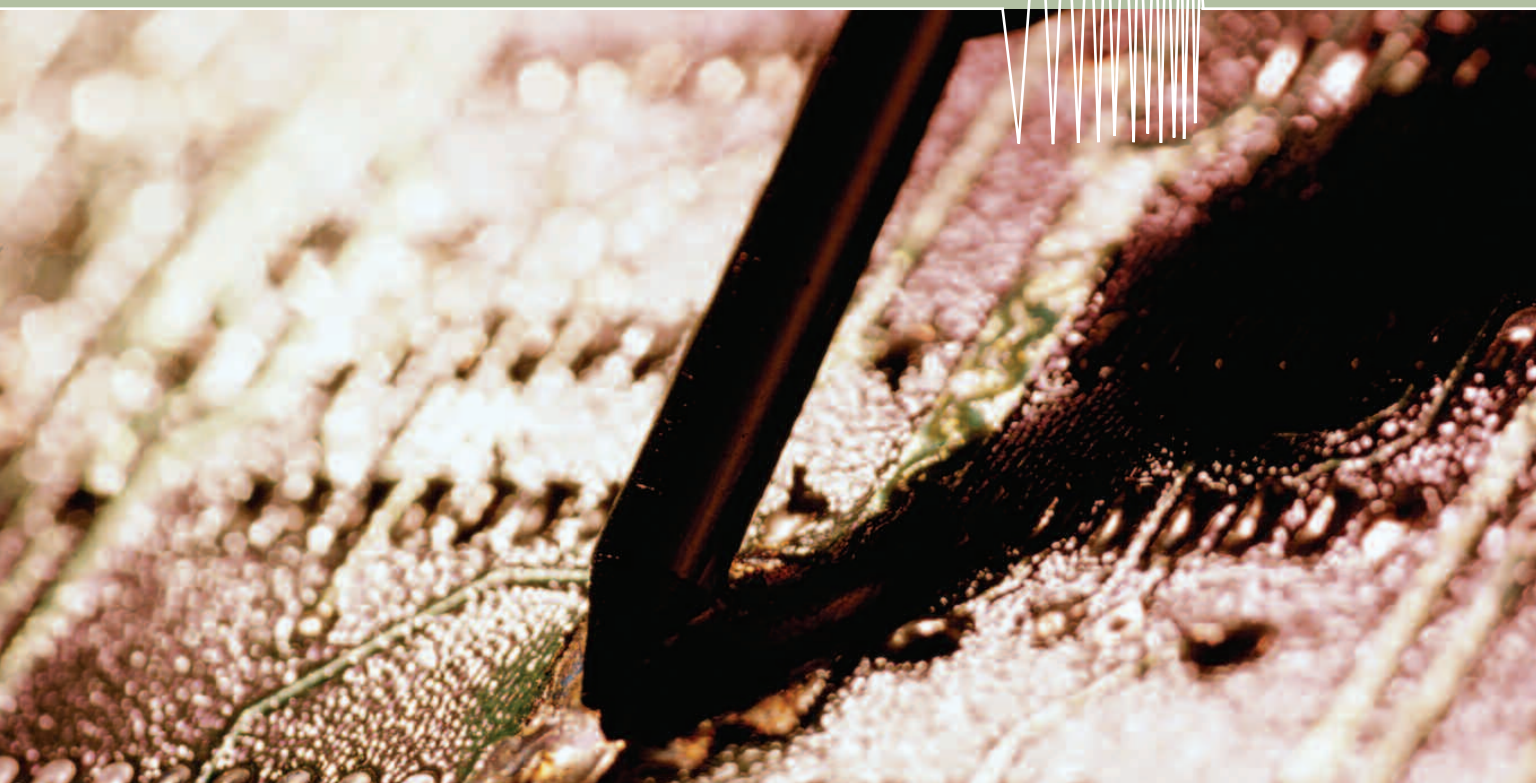
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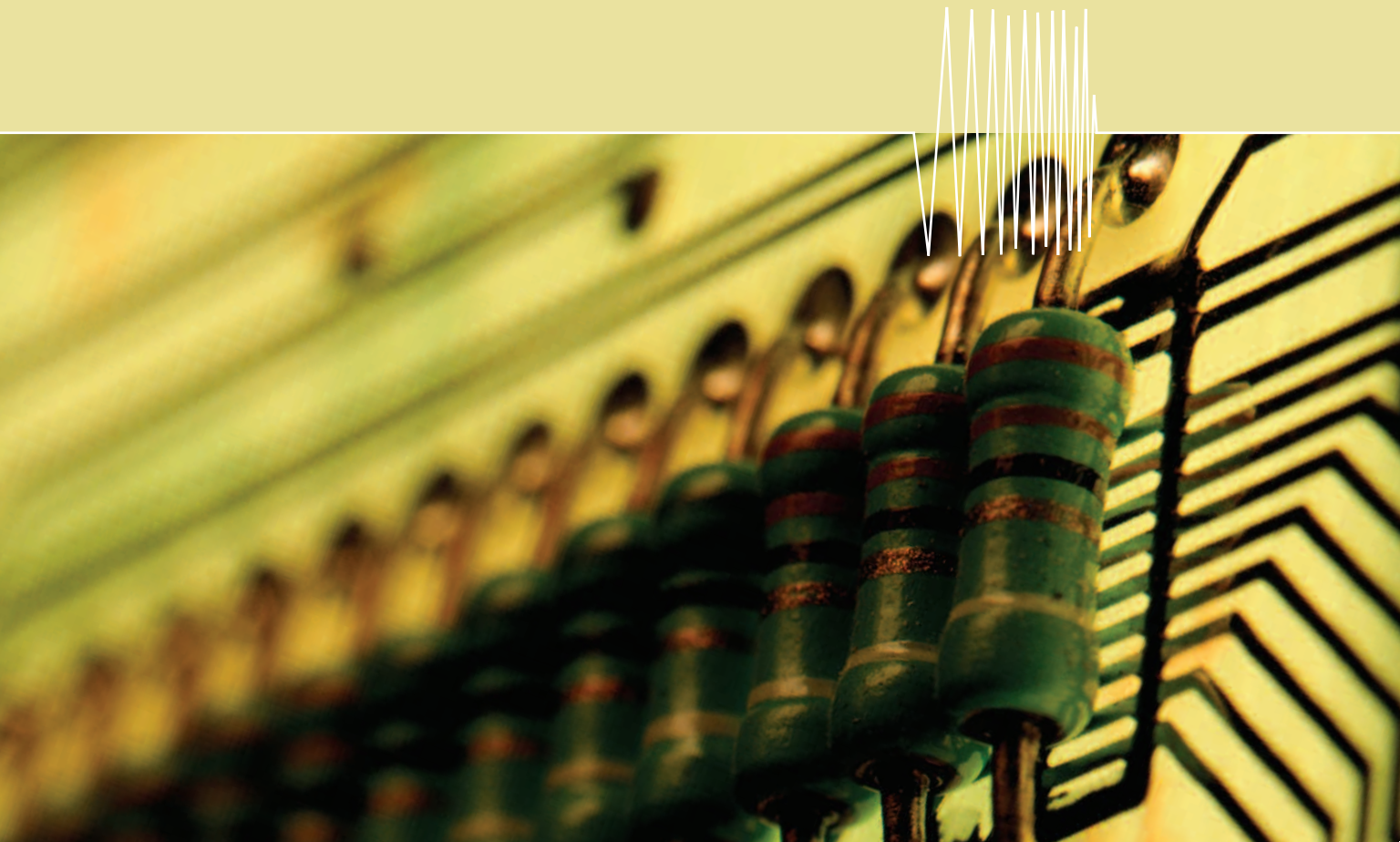
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FACILITIES



DEPARTMENT ESTABLISHES THREE NEW LABORATORIES

In an effort to improve the quality of education in computer engineering, the Department of Electrical Engineering invested its resources into setting up and equipping three new laboratories for the Computer Engineering Concentration of our program. The desired goals and foreseen benefits of this effort are listed below.

- 1 Become locally and nationally competitive with the top undergraduate and graduate Computer Engineering programs.
- 2 Orient our program towards demands of industry and provide students with the needed skills (theoretical and practical) to compete for jobs in the local as well as the national job market.
- 3 Being progressive and considering future trends in the Computer Engineering Area.
- 4 Having a more complete and diverse curriculum to better prepare students for the pursuit of graduate education.

THE THREE NEWLY DEVELOPED LABORATORIES ARE A COMPUTER ARCHITECTURE LAB, A VLSI LAB, AND A DIGITAL SIGNAL PROCESSING LAB. SPECIAL ATTENTION WAS GIVEN TO EQUIPPING THE LABORATORIES WITH THE LATEST TECHNOLOGY IN ORDER TO KEEP STUDENTS ABREAST WITH THE CURRENT TECHNOLOGICAL ADVANCEMENTS IN THE FIELD. A TOTAL OF 50 COMPUTERS WERE ACQUIRED TO SUPPORT THE THREE LABS.

Computer Architecture and VLSI Laboratories are two newly established laboratories developed for the Computer Engineering program. The two laboratories are adjacent and therefore they can be utilized simultaneously depending on the course needs. The Computer Architecture and VLSI Lab equipment includes forty computers, forty Altera FPGA boards and Altera MAX PLUS II software. The VLSI Lab equipment also includes Cadence Software Bundles for CIC Design, System Level Design, DSM Design, D&V, and PCB Systems. The laboratories provide students the opportunity to work on experiments regarding Assembly language programming, digital design using microprocessors, microcomputer design and control, memory and I/O interfaces, bus interconnections, computer arithmetic, pipelining, memory hierarchies, multiprocessor systems, semantics of the VHDL language and its applications, Verilog and System-C, and field programmable gate arrays (FPGA).

Digital Signal Processing (DSP) Laboratory is a laboratory available to the undergraduate and graduate programs in Electrical Engineering. The main goal of the DSP lab is to provide hands on experience to students studying basic and advanced Digital Signal Processing through courses such as Introduction to DSP, and Audio DSP, and through Independent Studies. The equipment available in the laboratory includes eight computers, eight TMS320 C5000 DSP TEACHING Kits, eight TMS320 C6711 DSP Kits, two TMS320 C6201 Evaluation Kits, two TMS320 C6000 DSP Imaging Kits, TMDX3260C6416 Test & Evaluation Bundle+ XDS510PP+ Emulator, and TMS320 c6000 Code Composers. Typical examples of projects that students are able to work on are filter design, signal analysis including speech and audio processing, and image processing applications including image compression.

THE THREE LABORATORIES HAVE A SIGNIFICANT IMPACT IN A NUMBER OF EXISTING COURSES AND HAVE BEEN FUNDAMENTAL FOR THE DEVELOPMENT OF NEW COURSES IN BOTH THE ELECTRICAL AND COMPUTER ENGINEERING CONCENTRATIONS. THESE COURSES INCLUDE:

Digital Design using Microcomputers, which teaches design of microcomputer based systems including both hardware and software considerations.

Microcomputer Design Lab, in which selected experiments in assembly language programming and digital design using microprocessors are performed.

Microcomputer Interfacing, which deals with the design of microcomputer based systems including both hardware and software considerations. It exposes the students to design and control of microcomputer hardware that is external to the PC, microcomputer structures, memory and I/O interfaces, bus interconnections, serial and parallel interfaces, and controller design.

Computer Systems Design I, which deals with the design process of digital computer systems from the instruction set level, system architecture level, and digital logic level. Topics include machine organization, register transfer notation, processor design, memory design, and input/output considerations.

Computer Systems Design II, which deals with the design, analysis and evaluation of contemporary computer systems in order to compare the performance of different architectures. Topics include performance metrics, computer arithmetic, pipelining, memory hierarchies, and multiprocessor systems.

Computer Architecture Lab, in which selected experiments examining programmable logic, VHDL and logic synthesis, and including a final design project, to accompany and complement the lecture course.

HDL Chip Design, in which a new design methodology for digital systems using hardware description languages (HDL) is introduced. It gives a complete treatment of syntax and semantics of the VHDL language and its applications. Emphasis will be on the design of combination logic, sequential logic, finite state machine, and register transfer level (RTL) digital system. Synthesis algorithms and issues will be elaborated. Other hardware description languages, e.g. Verilog and System-C will also be introduced. The design projects are simulated and implemented to a field programmable gate array (FPGA) system in the laboratory.

Embedded Microcomputer Systems, which introduces the student to the principles of embedded microcomputer system design and development for data acquisition and process control applications.

Digital Signal Processing, which deals with the time and frequency analysis of signals and systems, sampling and quantization, and various filter design techniques.

Audio Engineering, which deals with the time and frequency analysis of speech and audio signals and systems.

EXISTING FACILITIES

THE ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT HAS A NUMBER OF ESTABLISHED LABORATORIES FOR RESEARCH AND EDUCATIONAL PURPOSES. THESE LABORATORIES ARE CONTINUOUSLY UPGRADED BASED ON THE STUDENT, FACULTY, AND DEPARTMENT NEEDS.

Information and Systems Technology Research Center (IST-RC) The IST-RC is a multi-institutional center for theoretical and applied research in information and systems science and technology, led by UNO's EE Department. It is a cluster of research personnel from five Louisiana institutions of higher education: University of New Orleans, Tulane University, Louisiana State University, University of Louisiana-Lafayette, and Southern University-Baton Rouge. The focus areas of research are data fusion; target detection, tracking, and recognition; data mining and machine learning; signal and image processing; and sensors and sensor networks.

Center for Energy Resources Management (CERM) The CERM is a \$20 million research facility opened in 2002 in the UNO Research and Technology Park, focusing on biotechnology, energy, environmental research, geology, information technology, maritime technology, and technology transfer.

Information and Systems Laboratory (ISL) The ISL is a laboratory for basic, applied, and advanced research with a focus in the areas of information and systems, such as processing of information, data, signal, and image in various systems. The systems involved include, but are not limited to, control, communication, computer, and power systems and networks. Typical examples of applications include target tracking, data fusion, signal detection, machine learning, and pattern recognition.

Optics Laboratory Facilities include large vibration-isolated optical table, coherent laser systems, grating photopolarimeter, polarizing optical components, polarization analyzer, setups for fiber-optic polarimetry, photo-elastic modulation ellipsometry, and normal-incidence rotating-sample ellipsometry.

Ellipsometry/Polarimetry Laboratory Contains photopolarimeters using reflective silicon detectors (StokesMeters) and multi-mode Gaertner ellipsometer.

These two optics labs at UNO have served as incubators of new technologies in light polarization measurement using multiple reflective silicon detectors and diffraction gratings. These patented technologies have been licensed and transferred to Gaertner Scientific Corporation (Skokie, IL) and Containerless Research, Inc. (Evanston, IL). Other work includes the development of Normal-Incidence Rotating-Sample Ellipsometer, ellipsometric characterization of contaminated high-voltage insulators, and detection of adsorbed layers on silicon surfaces.

Analogue and Digital Controls Laboratories Educational lab containing computers and data acquisition boards used with LabVIEW software to perform simulations and experiments pertaining to basic analogue and digital feedback control systems. Additionally the lab contains Allen-Bradley PLC equipment used to introduce students to industrial application control systems.

Microwave Anechoic Chamber The anechoic chamber is a sealed environment containing absorption cones and has both absorption and isolation capabilities to facilitate specific types of equipment testing.

Energy Conversion Laboratory Educational lab which introduces students to building, operating, and mathematical modeling of Electric Machines and Electric Machine Systems. The lab contains three stations including power consoles, 3-phase Induction Motors, 3-phase Synchronous Machines, DC Machines, 3-phase Transformers, Single phase Transformers, Impedance Load Boxes, Resistance Load Boxes, Resistance Load Boxes. Also included and used in this lab are computers, analog and digital multimeters, analog and digital oscilloscopes, and analog and digital power meters.

Protective Relaying Laboratory Educational lab which introduces students to the use of Power System Protective Relays and Control Relays. Computer simulation and modeling of faulted power systems are done with digital protective relays. The lab contains protective relays and test equipment donated by Schweitzer Engineering Laboratories Inc.

Circuits Laboratory Educational lab which introduces students to building and testing basic electrical circuits and working with basic electrical laboratory test equipment to perform different types of electrical circuit measurements. The lab contains twelve workstations that include analogue and digital oscilloscopes, analogue and digital multimeters, and power supplies.

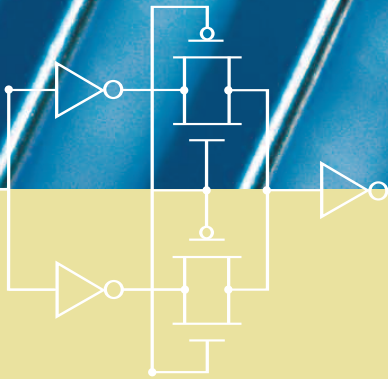
Electronics Laboratory Educational lab which introduces students to building and testing electronic circuits, including amplifiers and filters. The lab contains twelve workstations that include analogue and digital oscilloscopes, analogue and digital multimeters, and power supplies.

Communications Lab Educational lab which introduces students to building and testing communication system circuits, including modulators, demodulators, amplifiers, and filters. The lab contains power spectrum analyzers, oscilloscopes, and digital multimeters.

Microprocessor Laboratory Educational lab which introduces students to assembly language programming, and digital system design using microprocessors and microcontrollers. The lab contains computers and Motorola MC68KH11 development kits.

Senior Design Laboratory Educational lab which provides working space, computers, and basic measurement equipment to support senior level students working on their special Senior Design Project assignments.

INDUSTRIAL SUPPORT AND CONNECTIONS



The Department continually strives to maintain very strong connections with local industries to help ensure that our graduates are obtaining the knowledge and skills necessary to succeed as practicing engineers in today's ever changing industrial and technological world. There are two major integral components in our program which foster and support ties to local industry, the Electrical Engineering Advisory Board and the Capstone Project Course.

ELECTRICAL ENGINEERING ADVISORY BOARD

THE EE ADVISORY BOARD IS INTENDED TO PROVIDE A MECHANISM FOR THE DEPARTMENT LEADERS AND INDUSTRY REPRESENTATIVES TO COLLABORATE ON ISSUES OF IMPORTANCE TO THE DEPARTMENT. THIS INCLUDES DIRECT SUPPORT FOR THE DEPARTMENT MISSION BY:

- ◆ Ensuring the mission is appropriate both from an institution and industry view.
- ◆ Provide the Department access to effective industry techniques, process and expertise.
- ◆ Ensure students are as prepared as possible for careers in industry.
- ◆ Supporting departmental accreditation and certification efforts.
- ◆ Validating that processes are in place to ensure the mission remains current and relevant.

The EE Advisory Board membership will typically include the EE Department Chair, one to two ad hoc members of the EE Department, a non-voting IEEE Student Chapter representative and 8-10 industry representatives. An industry representative generally serves as the Chairman of the Advisory Board for a term of 2 years. The Chairman is responsible for meeting schedules and logistics, publishing meeting minutes and tracking action items, maintenance of the Advisory Board Handbook and other activities in support of the Board's Mission.

The current objectives for the EE Advisory Board are listed below

- ◆ Assist the EE Department in maintaining a general focus on design courses in the EE program. In particular, assist in developing and sponsoring industry related senior design (Capstone) courses during each semester.
- ◆ Participate in industry surveys to ensure that the EE program remains aligned with the needs of regional industries.
- ◆ Provide advice and oversight related to the processes of continually reviewing the EE program to ensure it remains aligned with the needs of the students, industry and the community.
- ◆ Participate in the assessment of equipment used to support laboratory and other courses. Where appropriate, advise or assist in the provisioning of equipment needed to address and identified improvement opportunities.

THE INDUSTRIAL REPRESENTATIVES ON THE EE ADVISORY BOARD DURING 2002-2003 ARE LISTED BELOW.

Reynold J. Abadie, Jr.

Director of Facilities & Environmental Operations,
Lockheed Martin Space Systems Company,
Michoud Operations

Anwer Bashi

Senior Research Engineer, Computrols, Inc.

Stephen D. Bourg

Principal, Crescent Consultants, Inc.

Darryl D. d'Aquin

President, CommTech Industries, Inc.

Brian L. Hardouin

Manager, BellSouth Telecommunications.

Raymond L. Harmon

Edwin Herasymiuk
Vice President, Gulf X-Ray Services, Inc.

Ray J. Johnson

Vice President and Chief Information Officer, Entergy Corporation.

Mark S. Jengling

Instrumentation Engineer, Boeing Company.

Charles J. Ledet

Vice President and Business Unit Manager, IO Marine Systems, Inc.

Ronald Ledet

Con-Select, Inc.

Steve Liggio

Engineering Division Manager, Point Eight Power, Inc.

John J. Maggiore, Jr.

Senior Electrical Engineer, Waldemar S. Nelson & Company, Inc.

Robert Mejia

Vice-President, Instrumentation & Control Systems
Technical Manager, M S Benbow and Associates

Ronald Miles

Director, Engineering, Neptune Sciences, Inc.

Gene Stafford

Powertronics System, Inc.

Harry Thompson

Director, Program Support Office, U.S. Navy, Space and Naval Warfare Command
Information Technology Center

CAPSTONE PROJECT COURSE

The Capstone Project Course is a senior level 3-credit course open to graduating seniors only. The general goal of this course is to have students work in teams to complete the design of an interdisciplinary engineering project. Most of these design projects are sponsored and mentored by local industry representatives.

In the Capstone Project Course, it is expected that students use computer tools throughout the project. This includes numerical calculation, report writing, preparation of drawings and visual aids, programming software, project planning software, etc. Students are required to work on a project in which they will design, develop, troubleshoot, and implement a working device or process. Since graduating-senior standing is required, students will be required to implement analog, digital, programming, microprocessor skills, etc, as well as to work with other interdisciplinary subjects such as dynamics, chemistry, etc. when and if required by the project. In addition, students are required to work as team members and to be able to follow timelines and goals as set in the project. This includes attendance to group meetings, writing of reports, oral presentations to other members in the group, and the ability to work within project management flow guidelines and budget constraints.

A project leader is assigned for each student team. The project leader's responsibility is to coordinate the group members' tasks and needs, and to ensure that the project is running within timelines and within budget. The project leader is responsible for keeping a log of a group member's attendance and general contributions.

The Capstone Project Course is an excellent tool for instilling in our students the importance of working on organized teams in engineering projects. It also provides our students with very valuable experience working with local industry on a real-world engineering project.

Some recent Capstone Project Course projects and their local industry sponsors are listed below.

BLACK AND WHITE FILM DENSITOMETER

Sponsored by: Gulf X-Ray Services Incorporated

The objective of this project was to design and prototype a handheld battery-operated densitometer using an 8-bit microcontroller. The device includes the following functions: measure black and white film density, operate using a single cell 1.5V battery, display values of 0.00 to 5.00 densities on an LCD with backlight, and include a user interface.

400HZ AUTOMATIC LOAD BANK FOR TESTING COMMERCIAL AIRPORT GENERATORS

Sponsored by: General Electric Company and Chiller Specialties

The objective of this project was to design and build a microcontroller based high power electrical load bank used to simulate the electrical load of a commercial jet aircraft. Currently at the New Orleans International Airport, when aircraft taxi to the airport terminal, they connect to ground power supplied by 60KVA, 115/200V, 3-phase, 400Hz generators. This project designed and built a load tester to simulate the load of the aircraft so that full-range operational load testing could be done on these airport generators to verify their operation and reliability.

CHEMICAL CLEANING PROCESS

Sponsored by: Lockheed Martin Space Systems, Michoud Operations

The objective of this project was to design and build a programmable logic controller based control system for an industrial chemical cleaning process. A scaled down model of an actual cleaning process used in the NASA Space Shuttle External Tank production is used as a basis for the project. Special emphasis is given to provisions for automatic safety interlocks and hazard detection instruments designed into the control system hardware including alarming. Examples of hazards include the presence of fire, failure of chemical delivery systems, and power loss.

480V MOTOR CONTROL CENTER FOR AN INDUSTRIAL FACILITY

Sponsor: M. S. Benbow and Associates

The objective of this project was to design and build an Allen Bradley programmable logic controller based motor control center for a manufacturing facility. The motor control center had to monitor and control up to 40 different motors ranging in size from 10HP to 75HP. The motor control center had to communicate with various control points located 100ft to 1000ft away.

HIGH VOLTAGE POWER TRANSMISSION LINE IMPEDANCE MODEL DETERMINATION

Sponsor: Entergy Corporation

The objective of this project was to develop a MS Windows based software package for mathematically determining the positive and zero sequence impedance models for any high voltage open conductor overhead power transmission line. The software package was required to have a graphical and easy to use interface for entering the physical construction data for a transmission line. Also the software package had to be able to import data from three different older DOS based software packages that were previously used.

FACULTY PROJECTS WITH INDUSTRY

IN ADDITION TO THE INDUSTRIAL TIES OF THE ELECTRICAL ENGINEERING ADVISORY BOARD AND THE CAPSTONE PROJECT COURSE, THERE IS ALSO A CONTINUAL EFFORT BY THE DEPARTMENT FACULTY TO BE INVOLVED WITH RESEARCH AND DEVELOPMENT PROJECTS IN COLLABORATION WITH LOCAL INDUSTRIES, PARTICULARLY THE NASA STENNIS SPACE CENTER AND NORTHROP-GRUMMAN SHIP SYSTEMS (FORMERLY AVONDALE INDUSTRIES). SOME SPECIFIC RECENT FACULTY RESEARCH PROJECTS FOR AND/OR IN COLLABORATION WITH LOCAL INDUSTRY ARE LISTED BELOW.

Development of a Vision System for Welding Applications in Shipyards

Dr. Dimitrios Charalampidis, Mr. Kim Jovanovich, and Dr. Abdul Alsamman for Northrop-Grumman Ship Systems

HACEM - A Fuzzy-Neural Highly Accurate Cost Estimating Model

Dr. Edit Bourgeois for NASA Stennis Space Center

High-Speed IC Testing Technique

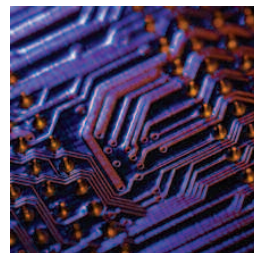
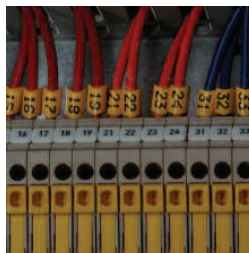
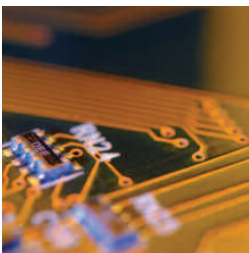
Dr. Sam Huang for IBM Microelectronics Research Labs

Portable Spectrophotometer for Cotton Quality Measurement

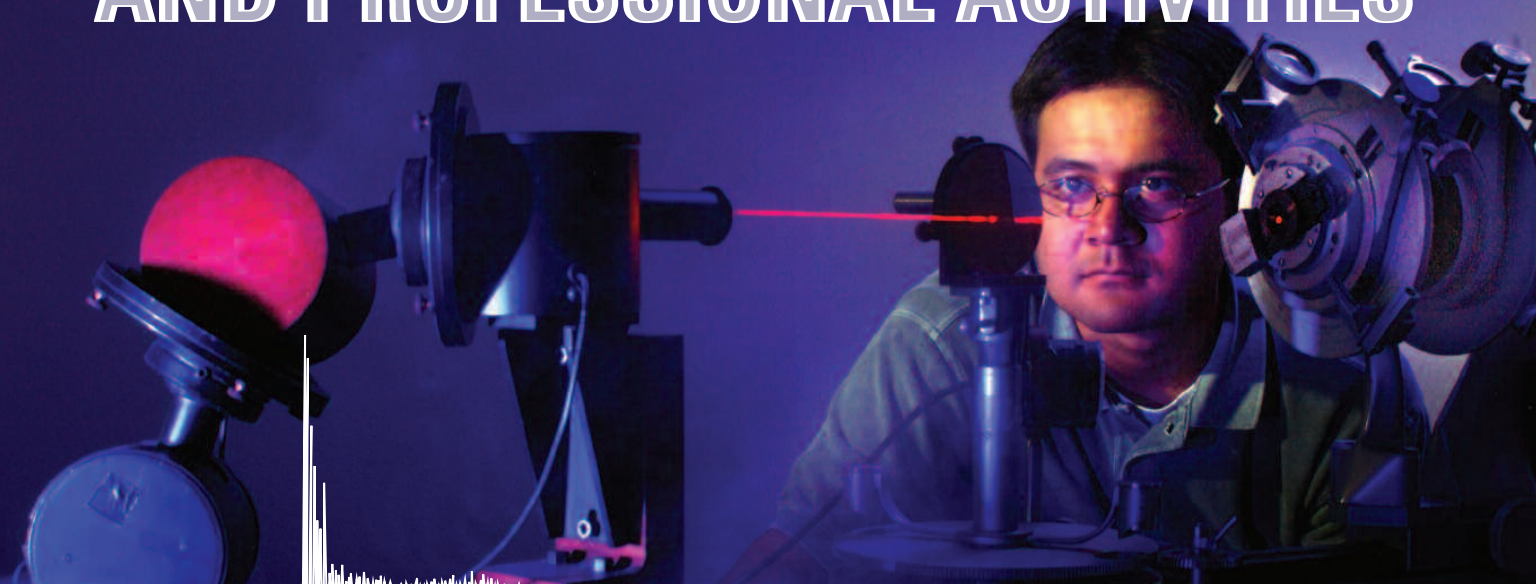
Dr. Sam Huang for SRRC USDA

Wireless Sensor Network for Streetlight Monitoring and Control

Dr. Sam Huang and Dr. Jing Ma for Telemics Inc. and SoftPower Inc.



RESEARCH AND PROFESSIONAL ACTIVITIES



Dr. Abdul Rahman Alsamman

Presentations

A. Alsamman, "Optoelectronic-based face recognition versus electronic PCA-based face recognition," SPIE's 48th Annual Meeting, San Diego, California, August 3-8, 2003.

A. Alsamman and M. S. Alam, "Performance of invariant face recognition techniques," SPIE's 47th Annual Meeting, Seattle, Washington, July 7-11, 2002.

Invited Lecture

A. Alsamman and M. S. Alam, "Pose Estimation Based Fringe-adjusted JTC for Face Recognition," Aerosense 2002, Orlando, Florida, April 1-5, 2002.

Dr. Rasheed Azzam

Presentations

R. M. A. Azzam and C. L. Spinu, "Infrared polarizers and retarders using internal reflection at the Si-SiO₂ interface," Annual Meeting of the Optical Society of America, Orlando, FL, 29 Sept.- 3 Oct., 2002. (Invited)

A. De and R. M. A. Azzam, "Optimal coated silicon membrane beam splitters for the division-of-amplitude photopolarimeter," Annual Meeting of the Optical Society of America, Orlando, FL, 29 Sept.- 3 Oct., 2002.

R. M. A. Azzam, "Light polarization: a rich source of information," paper presented at the Workshop on Information and Systems Technology, New Orleans, LA, May 2003.

S. Krishnan, R. M. A. Azzam, and S. Hampton, "Spectroscopic ellipsometry using the grating division-of-amplitude photopolarimeter (G-DOAP)," 3rd International Conference on Spectroscopic Ellipsometry, Vienna, Austria, 6-11 July, 2003.

R. M. A. Azzam, F. Sudratjat, and M. Nazim Uddin, "Transmission spectroscopic ellipsometer (TSELL) using prismatic substrates," 3rd International Conference on Spectroscopic Ellipsometry, Vienna, Austria, 6-11 July, 2003.

RESEARCH AND PROFESSIONAL ACTIVITIES

Reviewer

Journal of the Optical Society of America, Applied Optics, Optics Letters, Optical Engineering, Journal of Modern Optics, Review of Scientific Instruments, Measurement Science and Technology, and Thin Solid Films.

Other Professional Activities

Member of the Program Committee, Symposium on Polarization Measurement, Analysis, and Applications V, SPIE –The International Society for Optical Engineering Annual Meeting, Seattle, Washington, July 7- 11, 2002.

Member of the Program Committee and Session Chair, Third International Conference on Spectroscopic Ellipsometry, Vienna, Austria, July 6 - 11. 2003.

Attended the TWAS 9th General Conference in Beijing, China (October 15-19, 2003) as guest of the Chinese Academy of Sciences. Guest visitor of Tsinghua University (Beijing) and Fudan University (Shanghai), October 20-22, 2003.

Dr. Edit Bourgeois

Presentations

Kaminsky, E. J., and Freddie Douglas, "A Fuzzy-Neural Highly Accurate Cost Estimating Model (HACEM)", CIEF'2003 Conf. (3rd. Int. Workshop on Computational Intelligence in Economics and Finance), Cary, NC, Sept. 26-30, 2003.

Kaminsky, E. J. and J. Ayo, "TCM Without Expansion Penalty over Rayleigh Fading Channels," in IEEE/TRLabs Wireless 2002 Proc., 14th Annual Int. Conf. on Wireless Communications, Calgary, Canada, July 8-10, 2002

Conference Program Committees

Member, IEEE T&D 2005 Conference Committee, 2003-2005.

Session Chair, CIEF'03, North Carolina, Sept. 26-30, 2003.

Chair, local arrangements, 1st IST-RC Workshop, New Orleans, May 2003.

Judge, IEEE Region 5 student paper competition, Region 5 Conference, April 18-20, 2002

Reviewer

Journal of Communications and Networks, 2002.

ASEE GSW 2002 Conf., 2002

Positions

Institute of Electrical and Electronics Engineers, Vice-Chair of New Orleans Section, 2003; Secretary, New Orleans Section 2002.

Honorary Advisor, Tau Beta Pi, 2002 and 2003.

Dr. Carmen C. Canavier

Professional Activities

Member of the Editorial Board of the Journal of Neurophysiology since July 2003.

Permanent member of NINDS study section NSD-C since Jan 1, 2003.

Served as an ad hoc member of the Center for Scientific Review (NIH) IFCN-8 study section and on numerous NSF panels including the panels on Behavioral, Neuroendocrine and Computational Neuroscience and on Collaborative Research in Computational Neuroscience, and on the NSF Biomedical Engineering Advisory Committee.

IEEE Judith A. Resnik Award Committee May 2003-May 2005

Regular Member, Society for Neuroscience and the Institute of Electrical and Electronics Engineers (IEEE).

Dr. Dimitrios Charalampidis

Presentations

Image Compression and Neural Networks, Information and Systems Laboratory seminar, August 2002

Adaptive Image Compression, Information and Systems Laboratory seminar, October 31, 2003

"Texture synthesis based on cluster transition probabilities," Visual Information Processing XII, Aerosense, Orlando, April 23, 2003.

"Image compression using cascade of neural networks," Visual Information Processing XII, Aerosense, Orlando, April 22, 2003.

"Rotation Invariant Roughness Features for Texture Classification," International Conference on Acoustics, Speech, and Signal Processing, IEEE Conference, May 16, Orlando, 2002.

Professional Activities

Finance Chair for the Fifth International Conference on Information Fusion, 8-11 July 2002, Loews Annapolis Hotel, Annapolis, MD, U.S.A.

IEEE Counselor - UNO Student Branch (Spring 2003 - present)

Reviewer for several Journals including IEEE Transactions on Neural Networks, IEEE Transactions on Geoscience and Remote Sensing, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Signal Processing Letters, IEEE Transactions on Acoustics Speech and Signal Processing, IEEE Transactions on Image Processing, Pattern Recognition journal, Optical Engineering journal.

Dr. Huimin Chen

Presentations

"Data Association with Possibly Unresolved Measurements Using Linear Programming", ONR/GTRI Workshop on Target Tracking and Sensor Fusion, Newport, RI, 2002.

"Performance of Several Detectors for Probing Single Electron Spin Signal", DARPA MOSAIC Review Meeting, Los Angeles, 2002.

Reviewer

IEEE Transactions on Aerospace and Electronic Systems, IEEE Transactions on System, Man and Cybernetics (Part B), Automatica, IEE Proceedings

IEEE CDC and Aero Conf., 2002; IEEE LAN/MAN, 2003.

Dr. Hai Deng

Presentations

H. Deng, "Sidelobe reduction for efficient detection of multiple radar targets," SPIE Conference on Signal and Data Processing of Small Targets, San Diego, CA, August 2003.

H. Deng, "Signal Design and Processing for Orthogonal Netted Radar System," IEEE AP-S International Symposium on Antennas and Propagation, Columbus, Ohio, June 2003.

H. Deng, "Radar Target Recognition Based on Orthogonal Range Profile Extraction," IEEE AP-S International Symposium on Antennas and Propagation, Columbus, Ohio, June 2003.

H. Deng, "Dispersive Effect Correction for Ultra Short Impulse Signals using Joint Time-Frequency Transforms," Proceedings of 2002 IEEE International Workshop on the Ultra Wideband and Ultra Short Impulse Signals, Kharkov, Ukraine, October 2002.

Dr. Xin-Ming Huang

Reviewer

IEEE Transactions on Wireless Communication, IEEE Wireless Communication and Network Conference (WCNC'2003), Engineering Reconfigurable System Architecture Conference (ERSA'2003), IEEE Design Automation Conference (DAC)

Dr. Vesselin P. Jilkov

Presentations

"A survey of maneuvering target tracking—Part V: Multiple-Model Methods," 2003 SPIE Conf. Signal and Data Processing of Small Targets, San Diego, CA, August 2003

"Best Linear Unbiased Filtering for Target Tracking," 2003 SPIE Conf. Signal and Data Processing of Small Targets, San Diego, CA, August 2003

“Sequential Probability Ratio Test for Track Confirmation/Rejection,” 2002 International Conference on Information Fusion, Annapolis, MD, July 2002

“Performance Enhancement of IMM Estimation by Smoothing,” 2002 International Conference on Information Fusion, Annapolis, MD, July 2002

Reviewer

IEEE Transactions on Aerospace and Electronic Systems, IEEE Transactions on Automatic Control, IEEE Transactions on Intelligent Transportation Systems, AIAA Journal of Guidance, Control, and Dynamics, IEE Proceedings

Dr. X. Rong Li

Professional Activities

President, International Society of Information Fusion, 2003

Fellow, IEEE

General Chair, 2002 International Conferences on Information Fusion, Washington DC, July 2002

Panelist, Sensors and Sensor Networks Program, National Science Foundation, 2003

Organizer, Workshop on Information and Systems Technology, New Orleans, LA, May 2003

President, The Chinese Professionals Association in New Orleans, 2002–present

Vice President for Technical Activities, International Society of Information Fusion, 1999–2002

Organizer, International Workshop on Information Fusion, Beijing, China, May 2002

Organizer, International Workshop on Information Fusion, Xian, China, May 2002

Editor, IEEE Transactions on Aerospace and Electronic Systems, 1996–2003

Editor, Communications in Information and Systems, 2001–present

Invited Speeches

Plenary Talk, “Information Fusion for Estimation and Decision,” 2002 International Workshop on Information Fusion, Beijing, China, May 2002

Plenary Talk, “Information Fusion for Estimation and Decision,” 2002 International Workshop on Information Fusion, Xian, China, May 2002

“Information Fusion and Inference under Uncertainty,” University of Louisiana, Lafayette, November 2003

“Optimal Track Fusion,” Defense Science and Technology Organization, Edinburgh, Australia, July 2003

“Information Fusion for Inference under Uncertainty,” University of Western Sydney, July 2003

“Optimal linear estimation fusion for multisensor dynamic systems,” Workshop on Multiple Hypothesis Tracking – A Tribute to Sam Blackman, San Diego, CA, USA, May 2003

“Optimal linear estimation fusion: Sensor data compression,” Workshop on Target Tracking and Sensor Fusion, San Diego, May 2003

“Methods for comparing estimation performance,” Workshop on Target Tracking and Sensor Fusion, San Diego, May 2003

“Information Fusion for Inference under Uncertainty,” Workshop on Information and Systems Technology, New Orleans, LA, May 2003

“Multiple-model approach to fault detection and identification,” Louisiana State University, February 2003

“Information Fusion for Estimation and Decision,” University of Tennessee, Knoxville, TN, October 2002

“Optimal linear estimation fusion,” Alphatech, Inc., Boston, MA, June 2002

“Model-set design, choice, and comparison for multiple-model methods,” Workshop on Signal Processing, Communications, Chaos and Systems – A Tribute to Robinder Madan, Naval Underwater Warfare Center, Newport, RI, June 2002

“Best linear unbiased filtering with nonlinear radar/sonar measurements,” Naval Underwater Warfare Center, Newport, RI, June 2002

“Optimal update with out-of-sequence measurements for tracking,” Naval Underwater Warfare Center, Newport, RI, June 2002

Presentations

- “Comparison of sampling-based algorithms for multisensor distributed target tracking,” 2003 International Conf. Information Fusion, Cairns, Australia, July 2003
- “Distributed implementations of particle filters,” 2003 International Conf. Information Fusion, Cairns, Australia, July 2003
- “Update with out-of-sequence measurements for multi-sensor target tracking,” 2003 International Conf. Information Fusion, Cairns, Australia, July 2003
- “Optimal linear estimation fusion – part VII: dynamic systems,” 2003 International Conf. Information Fusion, Cairns, Australia, July 2003
- “Optimal linear estimation fusion – part VI: sensor data compression,” 2003 International Conf. Information Fusion, Cairns, Australia, July 2003
- “Performance comparison of optimally weighted LS and linear minimum variance estimation for linear model with random input,” 41st IEEE Conference on Decision and Control, December 2002
- “Optimal linear estimation fusion—part V: relationships,” 2002 International Conference on Information Fusion, Annapolis, MD, July 2002
- “Model-set design for multiple-model estimation—part II: examples,” 2002 International Conference on Information Fusion, Annapolis, MD, July 2002
- “Model-set design for multiple-model estimation—part I,” 2002 International Conference on Information Fusion, Annapolis, MD, July 2002
- “Fault-tolerant interval estimation fusion by Dempster-Shafer theory,” 2002 International Conference on Information Fusion, Annapolis, MD, July 2002
- “A survey of maneuvering target tracking—Part IV: decision-based methods,” 2002 SPIE Conf. Signal and Data Processing of Small Targets, Orlando, FL, April 2002
- “Multisensor statistical interval estimation fusion,” 2002 SPIE Conf. Sensor Fusion: Architectures, Algorithms, and Applications VI, Orlando, FL, April 2002

Dr. Jing Ma

Presentations

- “JBits-based Incremental Design Environment with Non-Preemptive Refinement for Million-Gate FPGAs”, International Conference on Engineering of Reconfigurable Systems and Algorithms, June, 2003
- “Design and Implementation of Enhanced Digital Pre-Distortion (EDPD) Algorithm for the Blue Digital Transceiver Board”, Co-op final presentation at Bell Labs, Lucent Technology, November, 2002
- Professional Activities:

Reviewer for IEEE Transactions on Wireless Communication, IEEE Wireless Communication and Network Conference (WCNC'2003), IEEE/ACM Design Automation Conference (DAC)

Organizer and assistant for the IEEE CAMP2003 & Xilinx XUP Workshop, UNO, New Orleans, May 2003

Workshop on Information and Systems Technology

A Workshop on Information and Systems Technology was held at the University of New Orleans on Friday, May 16, 2003 with participation of faculty and students from the University of New Orleans, Tulane University, University of Louisiana-Lafayette, and Southern University of Baton Rouge. The proceedings of the workshop have been published on the web at <http://ece.engr.uno.edu/isl/CD/contents.htm>.



FEDERALLY SPONSORED RESEARCH PROJECTS



The following is a list of federally sponsored research projects during 2002-2003, of which our faculty served as principal investigators or co-principal investigators.

Theory and Application of Hybrid Estimation, NSF (7/98–6/03)

Hybrid estimation is a new subject that deals with state or signal estimation in the presence of structural and/or parametric uncertainties or changes. This project studies its theory and application. Theoretical research includes development of variable structures and various algorithms. Applications in target tracking and detection, information fusion, and power systems are emphasized.

Multiple-Model Algorithms for Efficient Target Tracking, ONR (5/98–10/03)

In this project, various aspects of multiple-model estimation, particularly those important for target tracking, are studied. It includes algorithm development and design, model-set design, and performance prediction and evaluation.

Aircraft Safety: Control Upset Management, NASA (8/01–7/04)

This is a joint project with Louisiana State University and University of Louisiana. It aims at aircraft fault detection, identification, and early warning, as well as fault-tolerant control of aircraft.

Intelligent Signal Processing for Integrated Sensor Systems, Air Force Research Lab (9/03-9/06)

Novel algorithms are investigated to improve the effectiveness of space-time adaptive processing (STAP) in the heterogeneous clutter environments. Several innovative airborne sensor architectures are also proposed and investigated in this project.

Central Pattern Generators: Circuit Analysis and Modeling, NSF (2001-2004)

Methods from nonlinear dynamics are used to analyze model and biological oscillators as well as hybrid circuits composed of a biological oscillator coupled to a model oscillator that is numerically integrated using a computer. The biological oscillator is the pacemaker kernel from the pyloric circuit of the lobster.

Firing Pattern Regulation in Midbrain Dopamine Neurons, NIH-NINDS (2001-2005)

The dopamine neurons in the mammalian midbrain are modeled as nonlinear oscillators that can produce spontaneous pacemaker oscillations, burst firing, and irregular firing. Modeling is used to gain insight into the role of these neurons in the circuits of the basal ganglia that mediate motivation and movement.

End-to-End Packet Delay Dynamics: Identification and Prediction, Oak Ridge National Lab (11/02–10/03)

This project studies the end-to-end packet delay and round-trip time of the Internet. The emphasis is on prediction of the delay and round-trip time as well as identification of the corresponding dynamics.

Shipboard Applications of Lightweight Structures, ONR (5/02-9/02)

Lightweight structures aboard certain classes of ships are fabricated from welded thin steel plates. This project investigated the amount and causes of thin steel deformation during the welding process.

Highly Accurate Cost Estimating Model, NASA (4/01-5/02)

A fuzzy-neural cost estimation software system was developed to predict cost of performing engine and component tests at NASA's Stennis Space Center. The system includes several adaptive network fuzzy inference systems (ANFIS) to produce cost estimates. Approved as new technology in report NASA NTR SSC-00194, May 2003, and scheduled to appear in NASA Tech Briefs.

Laser Distance and Ranging (LIDAR) Technology in Shipyards, ONR (6/99-5/02)

In this project the use of LIDAR in shipbuilding applications was studied. A LIDAR unit was purchased and used to generate 3-dimensional models of ship structures. The LIDAR unit uses time of flight measurements to measure the distance from the unit to a point on a structure. By collecting the distance to millions of points on a structure it is possible to construct a "cloud of points" which accurately characterizes the spatial dimensions of that structure. The use of LIDAR in shipbuilding will allow better accuracy control and, hence, lower construction costs.

Active Control of Planing Hull Motions, ONR (8/99-8/02)

The "slamming" of high speed military planing boats in rough seas has been the subject of numerous studies over the past few years due to the increasing number of injuries suffered by personnel in these conditions. This project has led to the design of an active control system to decrease the forces on a planing hull subjected to severe wave action. An analytical model was developed, and an actual system built, for a 17 foot hull which incorporated a control system for trim tabs. The control system used acceleration measurements to constantly adjust trim tabs for an optimal trim angle for the hull.

STUDENT AND ALUMNI ACCOMPLISHMENTS



STUDENT AWARDS

The Recipients of Student Awards in The 2002-2003 Period are:

Richard Baumgartner

Phi Kappa Phi Honor Society Award, 2002
and EE Outstanding Achievement Award,
2002.

James Cagle

Robert Chandler Outstanding Student
Award, 2002

Courtney Chatman

Hudy C. Hewitt Memorial Scholarship, 2002

Tanya Christopherson

IEEE UNO Branch Outstanding Leadership
Branch Award, 2002

Holly Danker

Robert Chandler Outstanding Graduate
Award, 2002

Erin Dogan

NSBE Student of the Year Award, 2003

Osahon Eribo

LES Student of the Year Award, 2003

Henry George

Phi Kappa Phi Award, 2003

Elliot Halby

IEEE UNO Branch Student of the Year
Award, 2003

Robert Hingle, Jr.

IEEE New Orleans Section Award, 2002

Scott LeBlanc

Dean's Scholarship, 2003.

Jairo Meneses

Robert Chandler Outstanding Student
Award, 2003

Chukwuezugbo Nwosu

Fritz E. Dohse Founding Dean Award for
Outstanding Black Student in Engineering,
2002.

Luis Picornell

IEEE UNO Branch Student of the Year Award, 2002

Kashif Riaz

Boeing Scholarship, 2003, CommTech Industries Scholarship, 2003, and UNO Ambassador Scholarship, 2003.

Karen Roberts

IEEE UNO Branch Leadership Award, 2003

Jolene Robin

Wink Engineering Outstanding EE Student Award, 2002

David Ruth

IEEE UNO Branch Excellence Performance Award, 2002, and EE Outstanding Graduating Senior Award, 2003

Gregory Stein

Phi Kappa Phi Honor Society Award, 2002, Chevron Senior Scholarship, 2002, and Chevron Senior Scholarship, 2003

Faisal Sudradjat

Phi Kappa Phi Award, 2002, Delta Aimee's Outstanding Junior Scholarship Award, 2002, and IEEE New Orleans Section Scholarship, 2003

Ryan Thiel

IEEE UNO Branch Excellence Performance Award, 2002

Edmundo Toro

Boeing Scholarship, 2003, Wink Engineering Outstanding EE Student Award, 2003, and Chevron Junior Scholarship, 2003

Onome Ugbeme

Chevron Junior Scholarship, 2002.

ALUMNI ACCOMPLISHMENTS

Mr. Darryl d'Aquin (BSEE 1989) is President and CEO of CommTech Industries. He is also a member of the COE and the EE Advisory Boards.

Mr. Anwer Bashi (BSEE 1996, MS 1997) is Principal Security Architect and Senior Research Engineer at Computrols, Inc. e has appeared three times in "Who's Who in American Colleges and Universities.

Mr. William Bouchereau (BSEE 1983), currently with Lockheed Martin Michoud Operations was recognized at Awards Night 2003 as Operational Performance Honoree for outstanding Project Engineering contributions in the implementation of Construction of Facilities projects supporting External Tank production and Michoud Assembly Facility operations and maintenance. Projects included Replace Building 350 Roof, Boiler and Chiller (\$5.3M) and Replace Building 103 Roof (\$25.7M).

Mr. Stephen Bourg (BSEE 2000) is owner of Crescent Consultants, Inc. He is also Director of the New Orleans Section of IEEE and recipient of the IEEE Region 5 Outstanding Small Company" Award and the IEEE New Orleans Section 2003 James W. Joyner Fireman's Award.

Dr. Aed El-Saba (MS 1988) is Assistant Professor, Department of Electrical and Computer Engineering, University of South Alabama (Mobile, AL).

Mr. Chen He (MS 1998) is Senior Staff Software Engineer at Motorola. He has received the Motorola Silver Quill Award and is listed in Who's Who in America 2003.

Dr. M. Mostafa Howlader (MS 1994) is Assistant Professor, Department of Electrical and Computer Engineering, University of Tennessee (Knoxville, TN).

Mr. Ray Johnson (ENGR 1976) is Vice President and Chief Information Officer, Entergy Corporation and Vice Chairman at Edison Electric Institute, Technology Advisory Committee. Mr. Johnson is also the Chair of the UNO ECE Industry Advisory Board and a member of UNO's COE Advisory Board.

Dr. Ayman Kanan (MS 1992) became Distinguished Member of the Technical Staff, Lucent Tech./Agere Systems (Breinigsville, PA) in 2000.

Mr. Charles J. Ledet (BSEE 1987, MS 1989) is Vice President and Business Unit Manager, IO Marine Systems, Inc. (dba DigiCOURSE). He recently published the article "Marine Seismic Survey Positioning and Control Requirements Evolve" in Offshore Magazine, March 2003.

Dr. Jian Liu (MS 1996) founded PolarOnyx (Sunnyvale, CA), a technology company developing advanced products for next generation of optical wireless communications and optical sensing systems.

Mr. Keith Marx (BSEE 1993) currently with Lockheed Martin Michoud Operations was recognized for outstanding Engineering efforts in Maintenance, Planning, Design, and Construction. Keith started as a Maintenance Craftsman in 1987 and worked through an Electrical Engineering degree at UNO and has made significant contributions to the External Tank Program at the Michoud Assembly Facility. Keith's engineering work involved all aspects of the Facilities Department at the Michoud Assembly Facility.

Mr. Bruce Perilloux (BSEE 1983, MS 1984) has authored the book Thin-Film Design, published by SPIE Press (SPIE -The International Society for Optical Engineering, Bellingham, WA) in 2002.

GRADUATE COURSES



THE FOLLOWING GRADUATE COURSES WERE OFFERED IN 2002-2003

Estimation, Optimization, Tracking

- Advanced Random variables and stochastic processes
- Linear systems
- Analog and digital filter design
- Adaptive filtering
- Estimation and Kalman filtering
- Signal detection
- Advanced Information fusion
- Optimization techniques in engineering
- Target tracking

Power Systems

- Reliability, availability, and maintenance of eng systems
- Power system planning and design
- Protective relaying of power systems

Controls

- Digital control systems design
- Process control systems
- Advanced control theory
- Measurement systems

Signal and Image Processing

- Introduction to digital signal processing
- Introduction to digital image processing
- Neural networks
- Computer vision

Computer Engineering

- Microcomputer interfacing
- Modeling HDL
- Computer system design

- HDL chip design
- Microcomputer interfacing
- Computer architecture
- Optical computing
- Introduction to optical networking
- Optical computing
- Embedded system and sensor networks
- Reconfigurable computing
- Analog IC design
- Introduction to VLSI design
- Advanced VLSI design
- Electronic devices for IC

Communications and Audio

- Audio engineering
- RF circuit design
- Advanced communication system design
- Optical communications
- Data and computer communications
- Antenna Theory

Optics and Lasers

- Engineering optics
- Fourier optics
- Polarization optics
- Introduction to lasers
- Optical information processing and computation

Special Topics and Independent Studies

- Special topics in EE
- Advanced special topics in EE
- Advanced EE problems