



Senior Design Classes

Fall 2003

First Row, (l-r): Jeremy Elder, Jonathan Lilly, Sean Banerjee, Andrew Sebroski, Michael Householder, Roy West.

Second Row, (l-r): Katie Hartline, Matthew Bryant, Yonas Hasses, Keerthi Sivaneri, Clifford Price, Justin Smith.

Third Row, (l-r): Nathan Ratcliff, Scott Guinn, Jonathan Pauley, Athbi Alotaibi, Adwan Aladwani, Joshua Bunting, Brandon Schaeffer, Rich Visotcky, Ryan Ashley, Justin Blevins, Shaun Finn, Rocky Cianfrocca.



Spring 2004

First Row (l-r): Kunal Nidadavolu, Mohammad Al-qallaf, David Bell, Brett Squires, Charles Adkins, Justin Scott.

Second Row (l-r): Tim Pyne, Stephen Zarembo, Reza Razahgi Khamisi, Jeannine Myers, Umar Usman, Cheri Settell, Daniel Busch, Sohail Chaudhry, David Richards.

Third Row (l-r): Jeremy Lake, Hank Cathey, Rob Martin, Harvey Wargo, Greg Heiskell, Zach Bittinger, Matthew Russell, Justin Holstein, Mi Guo.

Fourth Row (l-r): Bakhit Almejarah, Saad AlMunifi, Usman Qureshi, Mohammad Al-Fares, Chjris Clemens, Garrett O'Neil, James Kelly, Jeremy Herback, Evan Bays, Marcus Jordan.

Fifth Row (l-r): Mark Biedler, Albert Lankford, Travis Kirby, David Beckwith, Todd Hedrick, Justin Price, Michael Lipscomb, Dan Nawrocki, Anthony Mercer, Janet Klinkhachorn.

Sixth Row (l-r): Nils Miller, John Larson, Pete Gonzales, Bryan Williams, Roger Bukosky, Ahmed Gul, Jenny Alsop, Kevin Kincer, Samuel Kurcaba.

Not Pictured: Zach Anglin



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THIRD CLASS RATE

Research Laboratories, Classrooms and Equipment Enhancements

The rapid advances in information technology are changing the scope and pace at which we conduct our educational activities; therefore, it is critical within the Lane Department to keep in step with these global technological advancements. Continuous upgrades of the Department's laboratories, classrooms and equipment are urgently needed to reflect the rapid changes in technology. Creating and maintaining top quality laboratory and classroom facilities has been identified by engineering accrediting boards as a pressing need to produce the best prepared engineering and computer science graduates. As such, the renovations are part of the Department's most important initiatives – to build upon its infrastructure, revitalize its facilities, and ensure that its students are provided with a relevant and contemporary education.

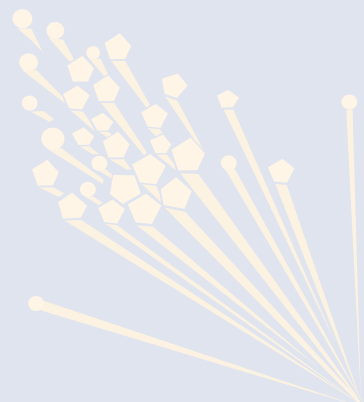
Look for articles throughout this newsletter reflecting the progress of our key laboratory and classroom renovation projects. These multi-million dollar endeavors will result in state-of-the-art facilities. Besides benefiting students, the Department receives valuable teaching resources and the companies who recruit our students will be able to hire highly-qualified graduates.



Tricia Kisner
Sets World
Land Speed
Record...
see page 13



Laboratory
named in
Joseph McGraw's
honor...
see page 3



Chair Chat



As you probably already know, I plan to step down as chair this summer. Dean Cilento has formed a search committee and an external search is underway. Ads appeared in the Communications of the ACM, IEEE Computer, and Spectrum.

As you also probably know, I had by-pass surgery in January. My recovery has progressed on schedule. After my chair duties are completed, I plan to stay connected with the department assisting with research projects dealing with homeland security and biometrics. One of the projects is the Lockheed Martin Radiant Trust Center of Excellence initiative, which is described in another article in this newsletter.

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The department is losing three valuable faculty members this year. Professors Bob McConnell and Frank Hiergeist are both retiring – more information about their careers at WVU is given elsewhere in this newsletter. We wish them well in their retirement. Ms. Camille Hayhurst, one of longstanding lecturers, has decided she wants more time with her family. Camille has been a valuable lecturer and we will miss her.

The department hired two exceptional new faculty members this past August: Arun Ross and Natalia Schmid. Details about them can be found another article in this newsletter.

In closing, I must thank two people who helped put the newsletters together. Laura Ann Ridenour, my secretary, has been invaluable in collecting information, working up the mailing lists, and providing administrative oversight. The other person who deserves special note is Micheline Grabulis, the editor of the newsletter. Micheline, or Sarge, as I like to call her, has organized the newsletters, prompted and cajoled faculty and staff to get articles, arranged the articles, worked on the graphics, interfaced with the printer, and overall produced the newsletter. Thank you Laura Ann and Sarge.

Leadership and learning are indispensable to each other.

John F. Kennedy (from a speech prepared for delivery in Dallas the day of his assassination, November 22, 1963)

George Trapp, Chairman



Robert E. Swartwout Microprocessor Laboratory Comes Online

By Mark Pullen (MSEE '72, D.Sc.,
Computer Science, GWU '81)

Many WVU Electrical Engineering graduates (and some Computer Science too) of the 1960s through 1980s will remember Dr. Robert E. Swartwout, who taught digital systems in the former EE Department. Remembered humorously for his "coke-bottle" glasses and fondly for his dedication to helping students learn, Bob Swartwout became an institution on the eighth floor of the Engineering Sciences Building. He seemed always to be engaged in some new scheme to provide an exciting learning opportunity. Many of us took every course he offered because his philosophy and teaching style led to deep understanding while at the same time making learning enjoyable. Many students from other departments, particularly the former CS Department, came to EE to feast at this same table. All of us have a collection of Swartwout stories, including of course the infamous "Swarty wrist slapper," a paddle of unlikely size that was nominally used in his metaphorical "slapping of wrists" when assignments were less than perfect.

Professor Swartwout retired in 1987 but continued to be active with the CSEE Academy. He passed away in 1999 and continues to be missed. Some of his many students and colleagues started a memorial fund to support the Robert E. Swartwout Microprocessor-Digital Systems Laboratory dedicated to his memory. A laboratory to help students learn seemed the best way to remember this man who did so much for so many students. You too may want to contribute to this project to help a new generation of students while honoring the memory of a lifetime spent making a real difference in many students' lives.

The lab was dedicated on the 2nd of April 2004.

Other recent laboratory dedications

By Melissa A. Soave, CEMR

McGraw Family

The microprocessing laboratory in the Lane Department has been named in honor of the McGraw Family. Joseph McGraw, owner of Greenbrier Technical Services, Inc., of Lewisburg, W.Va., along with his family, has given generous financial support to the lab.

In 2001, Greenbrier Technical Services pledged \$100,000 to enhance the laboratory. Since that time, new and upgraded lab equipment has been purchased and new learning experiences have been made possible to students. Joseph McGraw is a 1975 BSEE

graduate of WVU. His gift established the McGraw Laboratory Endowment Fund in honor of his father, Horace McGraw, and those members of the McGraw family who are alumni of the College of Engineering and Mineral Resources.

"I resolved years ago that, if I were ever in a position to ensure that WVU would have the most state-of-the-art equipment, I would," McGraw said. "It's (equipment's) not glamorous, but it is important that students and professors have access to and are familiar with the most modern equipment and technologies. The McGraw Laboratory Endowment Fund provides a mechanism for those concerned about this area. With additional contributions, this fund will grow to the point where significant equipment purchases, supporting the mission of the Lane Department, can be made each year," McGraw added.

Dean L. Curry Family

On September 12, 2003, the Dean Curry Circuits and Systems Laboratory was officially dedicated through the generosity of the Dean Curry Family.

The late Dean L. Curry was born in Fairmont, W.Va., and graduated from Fairmont High School. He attended West Virginia Business College in Fairmont and worked as a bookkeeper at Fairmont Aluminum Company until he enlisted in the Navy in 1942. He served on the USS Tulagi and attained the rank of aviation electronics technician mate, first class. After World War II, he wished to learn more about electronics and took preparatory classes at Fairmont State College.

He transferred to WVU and graduated with a Bachelor of Science Degree in Electrical Engineering in 1950. He earned a Master of Science in Electrical Engineering from Newark College of Engineering (now New Jersey Institute of Technology) in 1953. His first job as an electrical engineer was for National Union Radio where he met his future wife, Jean G. Webb. He was employed at RCA as an electrical engineer for 30 years, specializing in quality control. He received two patents for work for RCA and published in *Evaluation Engineering*, *The Electronics Magazine of Reliability Engineering*.

His only child, Catherine A. Smith, spoke at the dedication, which was also attended by other members of the Curry Family.

Department Chairman George Trapp thanks Joseph McGraw for his outstanding support to the Lane department while presenting him with a bronze plaque commemorating the laboratory named in McGraw's honor.



New Faculty

A Fond Farewell to our Retirees

The Lane Department was pleased to welcome two new faculty members as assistant professors for Fall 2003, Dr. Arun A. Ross and Dr. Natalia A. Schmid. Both work in biometrics and, by joining us, have profoundly strengthened the Department in this area.

Dr. Ross came to us with an MS Ph.D. in Computer Science and Engineering from Michigan State University where his research was on verification using hand geometry and information integration in fingerprint authentication. His BE degree is in Computer Science from Birla Institute in Pilani, India, and he is teaching both biometrics and computer science.

Dr. Schmid received her D.Sc. in Electrical Engineering from Washington University in St. Louis, Missouri. She also has degrees from the Russian Academy of Science and Moscow University of Physics and Technology. Her research is in statistical image processing, stochastic recognition, and authentication. She concentrates on theoretical analyses as well as experimental realization of developed algorithms. She is teaching in both biometrics and electrical engineering.

Elaine
Eschen
2003
Outstanding
Teacher

Each year the College of Engineering and Mineral Resources selects those individuals who have demonstrated exemplary performance in the areas of teaching and research. We are pleased to announce that Lane Department's Elaine Eschen was named Outstanding Teacher of the Year for 2002-2003. Congratulations Elaine !!



Dr. Robert L. McConnell will be retiring at the end of the Spring 2004 semester after being with the Department since 1972. Prior to that, he was an engineer for the IBM Corporation in Lexington, Kentucky. He received his Ph.D. in EE from the University of Kentucky.

McConnell has taught the senior design project sequence in the Department for over 25 years and has been instrumental in making it a true capstone experience. In addition, he has taught our electronics classes, circuits classes, and freshman engineering design. He has been the Department's laboratory coordinator, the probationary and transfer student advisor, and responsible for academic standards in EE and CpE. Some eight years ago, McConnell (with Wally Venable from MAE and Al Stiller from ChE) developed a new approach to teaching freshman engineering, parts of which are now beginning to be used for the new CEMR freshman experience.

McConnell co-authored with Dr. Kathleen Meehan an unpublished text in digital electronics, and published an engineering design text with Drs. Wils Cooley and Nigel Middleton. McConnell was involved in many research projects over the years, several related to mine electrical safety and, in 1993, was nominated for inventor of the year by National Aeronautical and Space Administration's Goddard Flight Center for his work in designing sensors for the space shuttle robot arm.

McConnell will be devoting more time to his family and the berry farm that he has been developing over a number of years.



Dr. Franz Hiergeist will be retiring at the end of the 2004 Spring Semester after 40 years as a faculty member at West Virginia University. He initially joined the Mathematics Department as an Assistant Professor in 1964 shortly after earning his Ph.D. in Mathematics from the University of Pittsburgh. He subsequently served as Associate Chair of the Mathematics Department from 1972 through 1979, where he received recognition as the Department's Outstanding Teacher in 1972, 1974, and 1979. In 1974 he also was selected as one of the Outstanding Teachers in the College of Arts and Sciences.

In 1982, Hiergeist moved to the Department of Statistics and Computer Science and later served as the Department's Associate Chair from 1994 to 1997. During this time and through the present, Hiergeist served as Coordinator of the undergraduate Computer Science Program. Since 1997 he has been a member of the Lane Department. Hiergeist's academic interests include summability theory, compiler construction, and programming language design.

In addition to his career with WVU, Hiergeist served as a consultant at the U.S. Department of Energy and The National Institute for Occupational Safety and Health in Morgantown, West Virginia.

For each of the past five summers Hiergeist has spent between one and two weeks attending a furniture making school in Indiana. He hopes to spend more time pursuing this avocation after retiring and devoting more time to his family.

Malcom Lane, President of the Lane Academy of Distinguished Alumni, congratulates Dr. George Trapp on his recent induction into the Academy.

Alumni Receive Departmental Honors



The two Lane Department inductees for 2003 were: Joseph McGraw, owner of Greenbrier Technical Services, Inc., of Lewisburg, WV; and John Silvester, Vice Provost of Scholarly Technology and Professor of Electrical Engineering at the University of Southern California.

Joseph McGraw (BSEE '75, MSEE Virginia Tech '77). Born in Beckley, WV, McGraw attended WVU and graduated magna cum laude with a BSEE in December 1975. In 1974-75 McGraw was chosen Outstanding Electrical Engineering Student by Eta Kappa Nu. McGraw attended graduate school at Virginia Tech and obtained an MSEE in 1977.

His first job after graduation was as a software engineer for the Bendix Corporation. While at Bendix, McGraw was involved in developing microprocessor software to control gas chromatographs. Later he managed a project to develop a process Infrared Analyzer based on technology from the U.K.

In 1983 he started his own company, Greenbrier Electronics. Greenbrier Electronics' produced a portable electronic tester, which would permit relatively lower skilled personnel to troubleshoot electronics. The product was successfully developed, but the sales were not great enough to support an independent company. McGraw sold the assets of Greenbrier Electronics to Temco Instruments, Inc., in 1986. McGraw subsequently worked for Temco for three years and was primarily responsible for Marketing and Sales.

McGraw left Temco in 1989 to form Greenbrier Technical Services, Inc. (GTS). GTS was initially founded to

provide electronic repair services to OEMS, industrial and commercial customers. Later replacement parts such as electronic modules and electromechanical assemblies were developed and now represent about 80 percent of the company's sales. GTS headquarters is located in Lewisburg, WV, and operates a production and repair facility in Ronceverte, WV.

John Silvester: (BS University of Cambridge '71, MS WVU '73, Ph.D. UCLA '80). Since 1979 Silvester has been at the University of Southern California where he is Vice Provost of Scholarly Technology and Professor of Electrical Engineering. As Vice Provost, he serves as the faculty/administration interface for the development of strategic plans for the effective use of information technology. He is Chair of the Board of CENIC, which is the organization that is building CalREN-2, California's next generation internet for the education and research community.

As Professor of Electrical Engineering, he teaches courses in Computer Networks Design and Analysis. His current research interests are traffic modeling, high-speed networks, and wireless packet networks. He is the author of over 100 technical papers and has lectured both in the United States and abroad.

Silvester was born in Kent, England, in 1950. He received his M.A. in Mathematics and Operations Research from the University of Cambridge; the M.S. in Statistics and Computer Science from WVU; and his Ph.D. in Computer Science from UCLA. He lives with his wife and two children in West Los Angeles.

Each year, the Lane Departmental Distinguished Alumni Academy recognizes those graduates who have had a distinguished professional career or who have been of outstanding service to West Virginia University. The three Lane Department inductees for 2004 are: George E. Trapp, Harry Morgan and the late Dean L. Curry.

George Trapp received his BS, MS, and Ph.D. degrees from Carnegie-Mellon University. He is currently a Full Professor at WVU and the Chairman of the Lane Department of Computer Science and Electrical Engineering.

Trapp is a Senior Member of the Institute of Electrical and Electronics Engineers, Inc., (IEEE). He has written over 60 research papers, primarily dealing with mathematical modeling, and has worked on developing national and international specifications such as IGES, STEP and the Department of Defense CALS standard. He has been a consultant to Westinghouse Electric Corporation, the Brookhaven National Laboratory, and the National Energy Technology Laboratory. He currently is involved with WVU's Biometrics Systems Degree Program, the Lockheed Martin RTCE Research Program, and WVU's Virtual Medical Campus.

Trapp's Research interests include information sharing systems, software development and mathematical modeling of electrical circuits.

Harry Morgan, earned his bachelor of science degree in computer science from WVU in 1985. Morgan retired from AOL in 2000 as a system architect. See article on page 10 entitled, CEMR Profiles of Greatness, for more detailed biographic information.

Dean L. Curry was inducted posthumously into the Academy. He attended WVU and graduated with a bachelor of science degree in electrical engineering in 1950. He earned a Master of Science in Electrical Engineering from Newark College of Engineering (now New Jersey Institute of Technology) in 1953. In September 2003, the Dean Curry Circuits and Systems Laboratory was officially dedicated through the generosity of the Dean Curry Family. See the article entitled "Other Recent Laboratory Dedications," page 3 for more biographic information on Dean Curry.



Catherine (Cathy) Smith, Dean Curry's daughter, accepts the Academy's inductee award on behalf of the Curry family. Congratulations are also extended by family friend, Professor Roy Nutter, Lane Department, and Malcolm Lane.



Malcom Lane congratulates Harry Morgan on his recent induction into the Academy.

IEEE Fellow Stats

From time to time IEEE hears questions or expressions of concern relative to how fellow nominees from industry fare as compared to nominees from academia. The data in the tables below (taken from IEEE's website) address these concerns.

Improving the Fellow Image

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While IEEE does normally receive more nominations for educators than for engineers from industry, this data indicate that the success rate for industry is comparable to that for academia.

Year	Education Nominations Received	Education Nominations Elected	% Success
1999	303	132	43.6%
2000	297	133	44.8%
2001	277	139	50.2%
2002	327	143	43.7%
2003	406	165	40.6%
2004	432	150	34.7%

Year	Industry Nominations Received	Industry Nominations Elected	% Success
1999	207	83	40.1%
2000	206	103	50.0%
2001	209	98	46.9%
2002	171	91	53.2%
2003	166	76	45.8%
2004	179	82	45.8%

Some Academy Members are IEEE Fellows

By F. Anthony Furfari, IEEE Fellow

A number of members of the Lane Department Academy of Computer Science and Electrical Engineering have received the honor of becoming Fellows of the Institute of Electrical and Electronics Engineers (IEEE). The grade of Fellow is conferred by the IEEE Board of Directors and only by invitation. To be considered for invitation, the nominee must have outstanding and extraordinary qualifications and experience and have made important individual contributions in an IEEE-designated field of interest: electrical engineering, computer science, computer engineering, electronics, radio, and allied branches of engineering or the related arts and sciences.

The following current Lane Department Academy members have achieved the distinguished honor of IEEE Fellows. Also included is the IEEE citation, which briefly describes their individual accomplishments.

Dr. M. Dayne Aldridge, Fellow 1999
For contributions to the design and application of electronic sensors and monitoring systems in the mining industry.

Mr. C. Denny Avers, Fellow 2003
For contributions to engineering education and accreditation of engineering programs.

Dr. David F. Barbe, Fellow 1978
For contributions to the theory, understanding, and development of charge-coupled devices.

Dr. William M. Brown, Fellow 1971
For contributions to linear systems analysis, random processes, and fine resolution radar.

Mr. F. Anthony Furfari, Fellow 1980
For technical and administrative contributions to the installations, servicing and maintenance of heavy electrical equipments.

Dr. Kenneth W. Goff, Fellow 1979
For technical contributions to and leadership in the design and development of hardware and software for digital computer-based process control systems.

Dr. Edwin C. Jones, Jr., Fellow 1988
For contributions to engineering education.

Mr. Joseph Koepfinger, Fellow 1976
For contributions to the applications of relay protection in power systems.

Mr. L. Bruce McClung, Fellow 1990
For leadership in the development of improved insulations and their impact on safety and reliability of electrical conductors and equipment.

Dr. Roy S. Nutter, Jr., Fellow 1993
For the introduction of microprocessors and advanced computer technology to applications in the mining industry.

Dr. J. Mark Pullen, Fellow 1991
For technical leadership in computing systems and networking.

Mr. Bernard W. Whittington, Fellow 1982
For leadership in electrical standards formulation and implementation.

Dr. Charles M. Wolfe, Fellow 1978
For contributions to the development of high-purity gallium arsenide for microwave and optical applications.

The IEEE has a membership of over 350,000 and is the largest professional society in the world, exceeded in membership only by the American Bar Association and American Medical Association. It receives about 800 nominations for the Fellow Grade each year. IEEE bylaws limit the total number Fellow selected in any one year does not exceed one-tenth percent of the total voting Institute membership.

By LaRue Williams, Grants Director, Office of Information Technology, WVU,
& Geoffrey Shaw, RTCE Executive Program Director

Lockheed Martin Radiant Trust

Lockheed Martin Corporation and Four Rivers Associates formed the first Radiant Trust Center of Excellence (RTCE) in February 2001 in the Lane Department of Computer Science and Electrical Engineering at West Virginia University. Participants in the WVU RTCE include researchers from WVU, the University of Pittsburgh, and Carnegie Mellon University. A second Center was formed in July 2003 at the University of Pennsylvania Wharton School Risk Management and Decision Processes Center, in conjunction with the Graduate School of Business at Columbia University.

The RTCE's interdisciplinary approach creates a synergy that bolsters its collective effectiveness. The initial thrust of the first two RTCEs is to provide world-class expertise in research fields that assist the Lockheed Martin Radiant

Trust program and product development efforts.

The WVU RTCE has several interrelated research projects underway. These projects address: information sharing risk assessment; information sharing taxonomy development and application; information sharing policy ontology development and application; continuous information sharing; policy compliance; information based risk assessment; continuous risk assessment effectiveness measurement; and auditing.

Accomplishments include: implementation of a prototypical information sharing taxonomy; analysis and scripting into a prototypical ontology of public policies related to personal privacy protection; and implementation of prototype software modules to test

conceptual approaches to an architecture that will support high volume trusted information sharing and risk assessment applications.

Mr. Geoffrey Shaw, Senior Executive Partner of Four Rivers Associates and RTCE Executive Program Director said at a recent meeting with RTCE researchers and University administrators, "The world class quality of professional research done here at WVU and specifically at the Lane Department... and the College of Business and Economics sets WVU apart. Here at WVU we are able to leverage and integrate a rich mix of multidisciplinary expertise in domains spanning software and systems engineering and architecture to complex business process assurance and public policy analysis. WVU researchers, students, staff, and administrators

SC² Visualization Workshop a Regional Success

On March 22, 2004, the Visualization Working Group of the Super Computing Science Consortium (SC²) held a workshop for Consortium partners in Pennsylvania and West Virginia interested in scientific visualization and virtual reality. Nearly 30 people attended from Consortium members Duquesne University, Pennsylvania State University, West Virginia University, Institute for Scientific Research, NASA, Pittsburgh Supercomputing Center, and the U.S. Department of Energy (USDOE). The workshop provided a mechanism for the partners to learn about each other's capabilities and research interests with a view to enabling enhanced support for the National Energy Technology Laboratory mission as well as other opportunities for teaming.

Below are snapshots of some of the presenters and attendees from this notable day.



Dr. Frances VanScoy of WVU is the chair of SC²'s Visualization Working Group. Here she delivers welcoming remarks and describes some of her areas of research.



David Deefield describing the Visible Human project, which allows 3D analysis of the human body in viewer-selectable planes.

Center of Excellence

combine world-class skills and expertise with a commitment to excellence, performance, and practical common sense that is both an example and an inspiration to us and to our customers and colleagues from around the world, many of whom have visited to learn more about the WVU RTCE program... [Our company] is privileged to work with so many of the best people in so many areas of expertise, and we look forward to many more years of research collaboration with this extraordinary community."

"We came here understanding how we could accelerate the development of some extremely sophisticated technology and related applications. Since we've been here we've learned that, at WVU, we can participate in accelerating the creation of new knowledge and

understanding of many things we had never anticipated. We thank you for letting us learn with you and for the example your university sets for us and for students, citizens and institutions around the world."

An important element of the RTCE effort is an analysis of the legal framework, case law, public and private policies associated with the protection of personal identification information. Under current doctrine, the laws and policies attempt to strike a balance between the need for privacy protection and the need for information disclosure. The initial segments of the current research provide an overview of the existing legal doctrine and proposed legislation pertaining to identification information in order to provide a framework for analysis of privacy concerns. Additionally, the RTCE is conducting research on the

sensitivities of different types of personal identification information used by businesses and governments.

A Radiant Trust prototype system will continue to be developed to support investigations and analysis of various concepts related to trusted information sharing risk assessment and effectiveness assurance including ongoing investigations of effectiveness metrics for information based identification authentication, information sharing taxonomy application, information policy implementation and compliance assurance, and continuous auditing of compliance with multiple policies governing information sharing transactions and processes, and systems wide information policy assurance.

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New Course on Computer Law Applied to Forensic CS and Biometrics

Computer forensics and the use of biometric technology pose complex challenges to traditional legal doctrine. To meet this need, the Lane Department initiated a new course on computer law and privacy for the Department's Spring 2004 Semester.



The course, taught by Dr. Lisa Nelson, Assistant Professor, Public and Urban Affairs, University of Pittsburgh, considers the unique legal issues of computer forensics and biometric technology against the backdrop of

traditional legal doctrine and case examples. The course first develops a framework for understanding the implication of new technologies with an overview of the constitutional framework, Fourth Amendment doctrine, First Amendment doctrine, and Privacy Doctrine. From here, the course considers the legal issues raised by biometric technologies and computer forensics.

This course provides students with an understanding of the legal context surrounding the application of computer forensics and biometric technology.

Upon successful completion of this course, students will:

- develop an understanding of the constitutional framework;
- understand the complexities of the Fourth Amendment, First Amendment and Privacy Doctrines;
- grasp the legal implications raised by biometric technologies and computer forensics;
- be familiar with case based reasoning; and
- will have gained experience in working within a team of their peers.

CEMR Profiles of Greatness

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The College of Engineering and Mineral Resources has many outstanding alumni; many of these graduates have gone on to become the presidents and CEOs of major companies, leading researchers, prominent educators, and inventors. They are working globally as engineers and computer scientists and are heavily recruited by industry.

To highlight its outstanding graduates and their careers, CEMR recently launched the Profiles of Greatness series which is featured on their website. Two Lane Department alumni, Rouzbeh Yassini and Harry Morgan were among those individuals recently featured in the Profiles of Greatness series. Excerpts from their profiles follow.

To read all the CEMR profiles, log on to:
<http://www.cemr.wvu.edu/news/>



Harry Morgan (BSCS '85)
Retired System Architect — America Online

After Morgan graduated in 1985 with a bachelor of science degree in computer science, he worked for HRB-Singer in State College, Pennsylvania, where he developed code for an antenna control unit. Soon after, Morgan married and moved to Pittsburgh, PA, where he worked for a factory automation company, American Cimflex. After five years, Morgan decided to move to Virginia and began working for a (then) small, unknown company named America Online (AOL).

"When I started at AOL, they only had seven computers that made up the host computer system," he said. "When I left in 2000, we had computer rooms the size of football fields and several thousand computers."

Morgan retired from AOL as a system architect in 2000 and lives in Leesburg, Virginia, with his wife and two sons. He now spends most of his free time involved with volunteer organizations.

Morgan was inducted into the Lane Department Academy of Distinguished Alumni in April 2004. (See article entitled, *Alumni Receive Departmental Honors*, page 5)



Rouzbeh Yassini-Fard (BSEE '81)
Founder and CEO YAS Broadband Ventures LLC

At the end of the third quarter of 2002, 17 million people across the U.S. and over 40 million worldwide, were connected to the Internet by broadband. No beeps, pops, whiz-twang whirs of dial-up. No time to make a bowl of popcorn while waiting for multimedia connectivity and getting their email to download. And each quarter, the number of subscribers climbs higher by the millions.

In well under a decade, broadband Internet access has become a \$12 billion industry in the U.S., and took only 4 years to reach an adoption rate of 10 percent. That's faster than the DVD. Faster than the cellular phone. Leaps and bounds faster than the color TV.

Nearly two-third's of U.S. and half of worldwide subscribers get broadband from their cable company, through a humble little box known as the Cable Modem.

And there at the birth of this technological and business phenomenon, was Lane Department's own Dr. Rouzbeh Yassini, known as the Father of the Cable Modem. Dr. Yassini, recognized and honored for inventing the technology, nurtured and drove the cable modem from a seedling idea, made it become a device, packaged it as a revenue generating opportunity, and then brought it all home with one of the most successful standardization projects of all time, called DOCSIS™.

Dr. Yassini is a benefactor of the University through his creation and support of the YAS Broadband Seminar Series.

Yassini Receives Honorary Doctorate

West Virginia University conferred an honorary doctor of science degree on alumnus, Rouzbeh Yassini (BSEE '81), at the 134th Commencement ceremonies in May 2003. Yassini has attained national/international preeminence in his field and has a sustained record of philanthropy and support of West Virginia University and its goals.

Yassini was born in Tehran, Iran. After attending the University of Phalvei for one year, he immigrated to the United States in 1977, settling in Morgantown. At WVU, he earned his B.S. degree in electrical engineering in 1981.

Yassini is founder and CEO of YAS Broadband Ventures, LLC. Yassini is internationally recognized as the "father of the cable modem." CED magazine named him "1998 Man of the Year" for creating and fostering the multibillion-dollar cable model "broadband" industry.

(l-r) Rouzbeh Yassini receives his honorary doctorate from President David Hardesty.



WVU Research Corp. Awards Electricity Research Center

The West Virginia University Research Corporation recently announced a \$225,000 award to promote formation of the Advanced Power and Electricity Research Center (APERC) as a university-wide research center at WVU.

The center team, which includes power and mechanical engineers, computer scientists, a mathematician and several economists, received the award from the Research Corp.'s Program to Stimulate Interdisciplinary Research, (PSIR).

"PSIR represents a new research investment strategy for the corporation," said John Weete, who is also Vice President for Research and Economic Development at WVU. "By supporting interdisciplinary teams of researchers and recognizing them as university-sanctioned centers, we hope to carve out niches of excellence for WVU in areas of importance to the state and the nation."

APERC's mission is to develop innovations in system-wide control of the power grid using operational and economic data.

"We want to keep the lights on at reasonable cost," explained Ali Feliachi, APERC's director.

"It's been said to the point of being cliché, but affordable, reliable electricity is critical for maintaining and improving

the standard of living in this country and around the world," said Weete. "Just ask the 50 million people who lost power last August in the Northeast or nearly all the Italians who lost power in September what the impact has been on them."

Some analysts have estimated the cost of the Northeast blackout at \$6.4 billion to \$10.6 billion. One news report from New York City highlighted the millions of gallons of raw sewage that poured into New York harbor when treatment plants failed and the 71 fires that were reportedly started by candles or malfunctioning generators, a 470 percent jump above the normal number of fires for that time of year.

"I am confident that APERC will succeed in its mission. The center is becoming nationally recognized for its work already," said Weete.



Five of the center's graduate research assistants have won national and international awards.

"Through ongoing research at WVU and the work of our master's and Ph.D. alumni in the industry, APERC stands to make a significant contribution to improving our power systems," he added. "We are relying on people like them to make sure the electricity is there when we turn the switch on."



Resource Room



Private interview room

New Career Resources Center

A Career Resource Center has been added to the first floor lobby of the Engineering Sciences Building. The new Center is multi-functional, providing a dedicated area where students searching for co-ops and internships can learn about employment opportunities, research potential permanent employers, and meet with representatives from various companies and agencies.

Corporate and student recruiters, take advantage of this great new opportunity to meet with our students and to offer reference material on your organization.

Hany's Lab

If you walked through the 2nd floor of the Engineering Research Building during the summer break last year, you would've noticed chairs being moved through the halls and new furniture being assembled. What you would've witnessed was an initiative by Dr. Hany Ammar to upgrade and refurbish the work environment available to his research students. Also, additional workstations were needed to complete the desired 15-workstation environment. The lab



Before: Ashraf Osman, Ph.D., working in outdated cluttered area.

work areas include state-of-the-art engineering tools specifically geared for software architecture design and development. In sharp contrast to its high-tech tools, the lab's workstations and office furnishings were in dire need of replacement and modernization to accommodate research personal computers and storage needs.

The refurbishment included 10 new workstations, room dividers, and office chairs. The space was also reconfigured to provide space to brief visitors to the lab. To the delight of the lab occupants, the new workstations allowed privacy and greater workspace for the engineers to work on customer research projects. Among such

projects is the Automatic Dental Identification System (ADIS) project, a 3-year \$1.2 Million project funded in part by the National Science Foundation and the National Institute of Justice, U.S. Department of Justice. The ADIS system is used by law enforcement agencies to locate missing persons using databases of dental x-rays. Come by some time when you are in the area and check out our new "look."



After: Walid Rabie, Ph.D. student, and Kalavani Appukaty, MS undergraduate, can be more productive in the new setting.



2003 computer engineering graduate, John Nozum (second from right) with senior design team members J. Reed Walker, Michael Lacasse, Cory Kesecker, and Dr. Wils Cooley.

2003 Commencement Feature John Nozum

by Melissa Soave, CEMR

Like many of his peers, computer engineering senior John Nozum is gearing up for the culmination of years of hard work and preparation – graduation. Unlike many of his peers, John has had a number of tremendous challenges along the way, most of which that came as a result of having Goldenhar's syndrome, (pronounced golden harz), a rare birth defect characterized by facial and cranial deformities.

Some research has led to some evidence that suggests Goldenhar's syndrome is caused by exposure to certain toxic chemicals and pesticides. John's condition appears to have been caused by his mother's exposure to chemicals in the workplace.

He has had about 35 surgeries in his lifetime and may still face future surgeries to correct ongoing problems caused by his condition. But through all of this, John's kept his great sense of humor and his great desire to learn.

In 1992, he earned a medical assistant degree from Belmont Technical College in St. Clairsville, Ohio. But due to a very poor job market in the field at the time, he was not able to find employment, even with looking in four states.

In 1994, a combination of his talents and special interests led him to Morgantown and then to WVU. John's always had an inventive streak and a keen interest in music. In fact, using Musical Instrument Digital Interface (MIDI), a means for instruments to communicate to each other and/or computers, he's composed about 50 original works. He can also play numerous instruments including the piano, organ, pipe organ, portable keyboard, accordion, guitar, harmonica, and drums and has over 500 instruments in his computer library. "To some people, a flute is just a flute, but to me instruments are a way to express things going on in my head that are hard to express verbally," explains John, – sounds like something Beethoven or Mozart might have said.

And as far as his inventiveness, he's always seemed to have what most future engineers have early on – a desire to make things work better. In 1994, he had a great idea for an invention which led him to the Patent Depository at WVU's Evansdale Library. The invention was an improved musical computer system that promises to give those in the music field significant new creative possibilities for composition and performance.

WVU librarian Natalie Rutledge noticed how quickly John mastered the CD-Rom based pre-application search system at the Patent and Trademark Depository Collection and suggested he look into studying computer science or computer engineering. She got him in touch with Professors Wils Cooley, Franz Hiergeist and Al Stiller from the Lane Department. He enrolled in computer science in 1996 and then switched to computer engineering in 1998.

Even though he enjoys programming, he switched to computer engineering rather than computer science because, according to John, "It involves more hardware design and a more active role in the design process."

The computer engineering program also allowed John to combine his medical training, music and computer interests to produce some really remarkable design projects such as a digital pulse monitor and a musical electrocardiogram (EKG). He presented the latter project in a student design competition at the Institute of Electrical and Electronic Engineers' Biomedical Engineering Society Annual Conference in Atlanta in 1999, where he placed fourth overall.

The EKG is one of the most commonly used vital signs used clinically. EKG's carry a wealth of diagnostic information for the clinician; however, because small changes in a patient's EKG can be difficult to notice on a monitor screen, John devised an additional mode of EKG analysis. In doing so, he created software that can take standard EKG data and convert it to a "musical" form. The conversion is done in real time, since the main idea is to use the technology in an Intensive Care Unit setting, where a patient's EKG "tune" can change swiftly from one minute to the next.

"What I developed was a 'musical interpretation' of the EKG waveform in such a way to make the detection of small, but potentially critical changes, easier," said John. Dr. Cooley, who advised John on his project work, describes John as a "natural" designer because his design work is so well attuned to the need of those people who will use it.

While at least a couple other products have been marketed for converting EKG data into music, these were more for pleasure and being creative with the idea of using body signals as the foundation for newly devised music. These products have little or no diagnostic value on the musical end.

So what's next for John? His ideal job will be one that uses his strengths, which are his creativity and inventiveness and his computer skills. He's also interested in a line of work that directly or indirectly makes the world a better place – "When I'm helping others, I find I'm helping myself", says John.

World Land Speed Record

Tricia Kisner (BSCPE '99), a senior member of the Research Staff with the Institute for Scientific Research, Inc. (ISR), set a new world land speed record of 317.380 miles per hour while driving the #355 "Grumpy Old Men" Lakester racecar at Speedweek 2003.

Kisner and the race team from Fairmont competed in Speedweek, an annual international land speed competition held at the Bonneville Salt Flats of Utah in August 2003. The competition annually attracts more than 400 vehicles from around the world. In addition to setting the world record, Kisner became the first person ever to enter a landspeed racing event as a rookie, qualify for all licenses, and become a member of the "300 mph Chapter" of the "200 mph Club" — all in the same week.

Kisner was competing in the Class "A" Engine, Blown Gas Lakester category. The previous record in the class stood at 293.196 miles per hour and was set in the early 1990's. Kisner also set the "Fastest Time of the Meet" with an exit speed of 325.810 miles per hour, becoming the first female ever to do so. Kisner was 26 at the time she set the record.



Kisner, who works in ISR's Robotics and Intelligent Controls program, praised the efforts of her racing colleagues, affably nicknamed "Grumpy Old Men." "It's important to note that the team set the record, I was simply the driver," stated Kisner.

The racecar is owned by Joe Law of Fairmont and was sponsored by ISR at the time of the race. It has already set 14 world records in four different classes, including a speed of 355 miles per hour in an unofficial run which made the #355 Grumpy Old Men Lakester the "World's Fastest Lakester" as well as the "World's Fastest Gasoline Powered Car."

Tricia Kisner proudly poses with #355, "Grumpy Old Men" Lakester racecar.

WVU a finalist in the International Fuel Cell Competition

NETL hosts contest to perfect low-cost source of power
Portions by: Jake Stump, The Dominion Post

Considering their efficiency and environmental-friendliness, fuel cells seem like the perfect driving force in running cars and homes, says Dr. Jo Howze, Dean of Engineering at Texas A&M University.

The only impediment to fuel cell energy, however, is the cost.

Answering a challenge posed by the U.S. Department of Energy, engineering teams from dozens of universities began looking for cost-effective solutions more than a year before the start of the competition. Five finalist teams, including WVU, brought these solutions to the second Future Energy Challenge at the National Energy Technology Laboratory (NETL) in Morgantown, WV, in May 2003.

The other finalist teams were Seoul National University of Technology, Texas A&M, Virginia Polytechnic Institute and State University, and the University of Wisconsin. Fourteen teams competed in the 2001 Future Energy Challenge, which successfully concluded in August 2001. The 2003 challenge grew to 19 teams and has gained an international scope, with more schools expected in future competitions.

Student team project results were judged based on cost effectiveness, performance, quality of the prototype and other results, engineering reports, adherence to rules and deadlines, innovation, future promise, and related criteria. Each aspect of judging was scored according to a

point list and Test Protocol published in the Future Energy Challenge Rules. The judging panel included experts from IEEE Power Electronics Society, Industry Applications Society, Power Engineering Society, and representatives from manufacturers, national labs, independent test labs, utilities, and R&D engineers.

"A fuel cell produces constant DC voltage," said Howze, chairman of the competition. "It's like a battery with a full supply. Appliances in homes, however, require AC signals." Teams first submitted a report detailing their inverter designs and cost analyses. A team of expert volunteers then judged the reports based on engineering criteria and selected five finalist teams.

"The outcome of each team's study may be crucial to the future of technology: people will have to depend on it for national security," Howze said.

Power supply and fuel cell duration tests will be conducted through the week. "Each inverter goes through a safety inspection," said Dr. Randy Gemmen, of NETL. "We're dealing with high power. Somebody could get hurt."

Sponsored by American Electric Power, the Lane Department of Computer Science and Electrical Engineering, and the College of Engineering and Mineral Resources, the 13-member WVU team continued work on its project right up until the start of the competition.

The WVU team was a strong contender at every step along the way. "In the two months leading to the competition, we've been working 18 hours a day to meet the deadlines" Famouri said. After all was said and done, however, Seoul National University of Technology won the first place overall best inverter performance award of \$25,000.

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WVU Fuel Cell Team with faculty advisor Parviz Famouri. (far right)



WVU engineering students William Wallace and Pradeep Pant prepare an inverter for testing during the National Energy Technology Laboratory's second Future Energy Challenge. WVU was one of five universities across the globe that qualified for the competition.

2003 Lane Department Photo Album



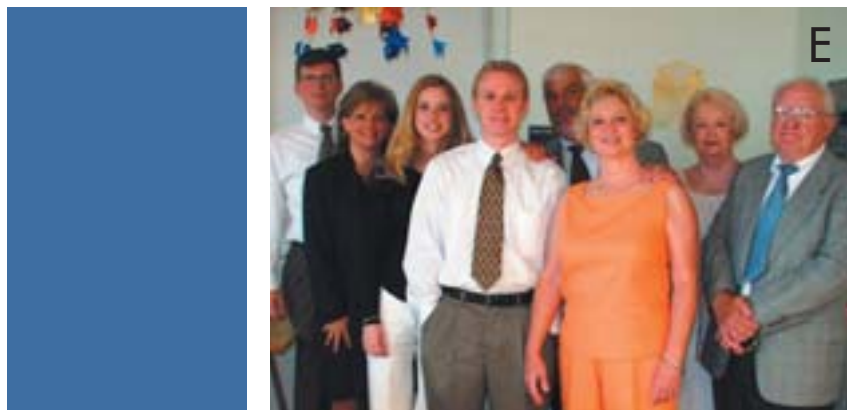
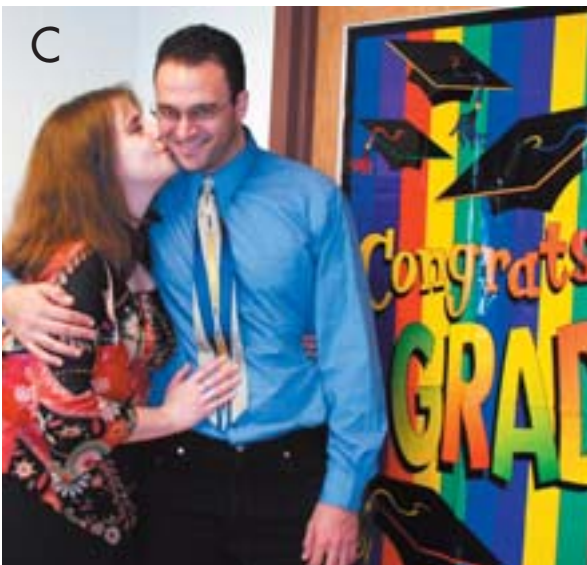
Senior Design Class Spring 2003



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1st Row (l-r): Jay Wilhelm, Jonathan Davisson, John Nozum, James Walker, Cory Kesecker, Michael Lacasse, Jon Williams.
2nd Row (l-r): James Lancaster, Michael Davis, Akintunde Akinbola, Brian Harrig, Aaron Mace, Kwame Scott, David Czekaj, David Tyner, Diana DeCarlo, Bradley Palm.
3rd Row (l-r): Jennifer Patton, Joshua Wise, Michael Ellis, Benjamin Knabenshue, Brian Sell, William Wallace, Michael Dills, Frank Prebeg, Magdalena Purnama, April Williams, Justin Harsh.
4th Row (l-r): Gary Solomon, Mohammed

Alnatheer, Dean Landers, Farooq Haji Abdullah, Ross Bury, Michael Burkey, Pradeep Pant, Curtis Flusche, Ryan Stickles.
5th Row (l-r): Thomas Williams, Terry Jordan, David Estep, Joshua Swann, Ricky Hussmann, Corey Friend, Michael Stull, Brandon Downey, Scott Piegols.
6th Row (l-r): Christopher Smith, Kush Scott, Kyle Deaton, Peter Gabor, Jared Cale, Paul Myers, Chelsea Finch.
Not Pictured: Travis Flanagan, Mitchell Ross, Corey McKinney.





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H



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K



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M



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Captions

- A. (l-r) Ashraf Osman (Ph.D. '03) and his wife, Rania Elnaggar (MSEE '03), pursuing her Ph.D. in CpE. Rania delivered their son, Mostafa, on August 23rd (see baby a.).
- B. Caption under photo.
- C. (l-r) Carlos R. Iga (MSSE '03) and wife Rachel Welsh De Iga.
- D. Graduate Kwame Z. Scott (BSCpE '03) with family and friends.
- E. Wade Tyner (EE '03) (front in white shirt, tie) with (l-r) Steve and Gale Carroll, Jaclyn Carroll, Wade's parents David and Jan Tyner and Irene and Don Phillips. Wade was a member of the now defunct Rifle Team. His senior design project proposed a wireless remote rifle sight level.
- F. (l-r) Kumar Vinod (MSCS, '03), Sandhu Harjinder (Soil Chemistry (Ph.D.), MSCS, '01).
- G. (l-r) Xueyan (Sherry) Xu, Ph.D. ¹⁵ celebrating with Michael and Tieliang Yan, Ligong Yu, and Limin Wang.
- H. Amber Li, born on January 16, 2004, daughter of Lane faculty member, Xin Li.
- I. Graduate Michael Lacasse (2nd from right), president of Tau Beta Pi - Engineering Honors Society sharing the events of the day with fiancée Emily Morton, parents Jane and Richard and brothers Andrew (l), and Daniel (r).
- J. Tim Barnickel (seated far left) at table enjoying the brunch with his family.
- K. (l-r) Jeff Rinker (MSEE '02), April Williams (BSCpE '03), Lois Gritt, Kevin Williams.
- L. Happy Halloween! **Front Row:** Karen Grimm (Mad Hatter), Maggie LeMasters (Mad Hatters bride), Marc Seery (Greek God), Sharon Chadderton (Sony Bono) **Back Row:** Vicky Rousseau (Football player), Chris Randall (Cher)
- M. (l-r) Seated: Deasy Tan; Magdalena Purnama (BSEE '03); Silvia Atmadja Standing: Sandrawati Purnama; Mi Guo.
- N. Standing Graduate Jonathan Williams, with Brenda Williams, Madeline Pleasant; seated - Janna Williams and Jennifer Williams.