

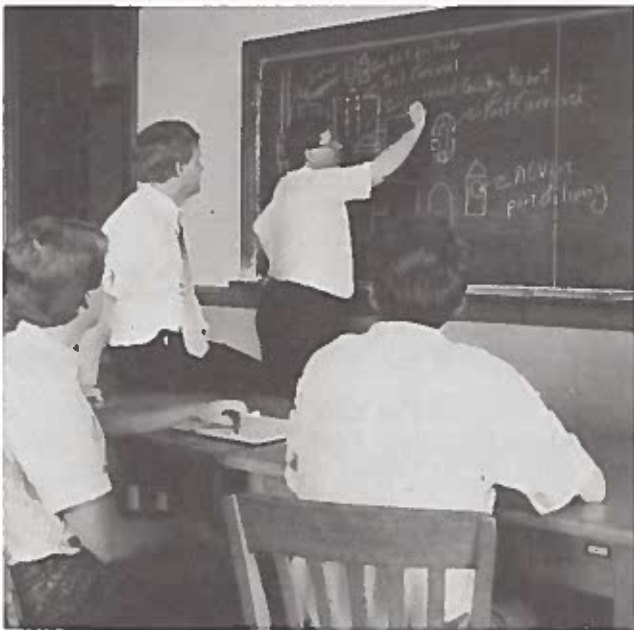


GENERAL ENGINEERING NEWSLETTER

Department of General Engineering, University of Illinois at Urbana-Champaign

VOLUME 32, NUMBER 1

FALL 1989



Prof. Wayne Davis outlines project in new Manufacturing Systems Laboratory as Prof. Dan Thompson and two GE students observe.

GE Faculty Holds All-Day Retreat To Discuss Future

Faculty members of the Department of General Engineering met at Allerton Park Conference Center near Monticello, Il., Saturday, Nov. 4, for an all-day retreat.

Dean W.R. Schowalter of the College of Engineering gave the keynote address Saturday morning.

The rest of the morning was devoted to a general discussion of the undergraduate program and how to prepare students for the 21st century.

During the afternoon discussions centered on the graduate program and the proposed Ph.D. program.

Other subjects during the retreat dealt with matters related to setting directions for the department for the future.

Elected a Fellow

Prof. Henrique L.M. dos Reis has been elected a fellow by the British Institute of Non-Destructive Testing.

Davis, Thompson Launch New Research Laboratory To Aid Manufacturers

Using the financial resources from corporate, federal and university sources, Prof. Wayne J. Davis has established a Manufacturing Systems Laboratory (MSL) in the Department of General Engineering.

The laboratory will investigate a wide scope of research problems arising in the implementation of manufacturing applications. Three focal topics of research have already been selected.

The first topic will address the issues of real-time decision making with applications to the real-time production scheduling problem in manufacturing systems. The published algorithm being investigated in the MSL represented a collaborative development with Dr. Albert T. Jones of the Automated Manufacturing Research Facility (AMRF) at the National Institute of Standards and Technology (NIST).

Using a National Science Foundation Equipment Grant and a cost-sharing grant from the Department of General Engineering and other university sources, a collection of Macintosh II computers were networked into a "computer farm" which currently provides the computational foundation for the MSL. Using the computer farm, the technique of real-time Monte Carlo simulation has recently been implemented and will be introduced to the manufacturing public at the AMRF's Open House from Nov. 13-17, 1989 in Gaithersburg, MD.

The realization of the real-time simulator, which is the heart of the real-time scheduling algorithm, represents a collaborative research effort with the People's Republic of China. Approximately one year ago, Prof. Hao Wang of the Xinjian Institute of Physics with the support of the Chinese Academy of Sciences and the Department of General Engineering, visited and assisted Prof. Davis in a year-long effort to implement the real-time simulation technology.

Although Prof. Wang has since returned to China, he also trained several graduate students who are now continuing his pioneering efforts. Recently, other researchers at the AMRF have adopted the real-time scheduling algorithm as a conceptual platform for implementing a cell controller at a flexible manufacturing cell (FMC) to be established at the U.S. Department of Army's Rock Island Arsenal (RIA) at Rock Island Arsenal. Through research support from the NIST, two graduate students in the MSL are now currently providing a feasibility study for the FMC at the RIA.

(Continued on page 4)

From the Department Head



The undergraduate enrollment in General Engineering this fall has increased to 595 students, which is in the approximate range of the enrollment a decade ago when the Department had an entirely different profile. In 1979 we were embarking on a new M.S. program and the research involvement of the faculty was modest. Today, the research involvement of the faculty is at a much higher level, and we have 36 graduate students in our program. The profile of the faculty has changed radically. The faculty are younger and research oriented; the pressures associated with maintaining both a high level of research involvement and teaching involvement are very high indeed. We graduate 81 students in academic year 1987-88; last year (academic year 1988-89) we graduated 120 students—a 50% increase! We expect to graduate approximately 120 students again this year.

Some demographics on our undergraduate student body in General Engineering are: 23.5% female, 2% black, and 2.7% Hispanic. The University has made a commitment to increase the number of our students who are black and Hispanic. It is well known that the number of minority students who attend college and, more particularly, those who complete an engineering degree, are much smaller than is really healthy for our society. We must attract more minority students into engineering, for this is a very good way to provide role models in the black and Hispanic communities to induce even more students to follow careers in science and technology. Another pressing problem that we have which is ultimately related to the flow of minority students in engineering is the pitifully small pool of minority Ph.D. level individuals who could be attracted to teach at Illinois and at other major research universities. We must do all we can do develop more minority students up to the Ph.D. level who will, hopefully, take faculty positions at the major research universities in the country.

This year we have 35 graduate students and, as a goal for next year, we hope to increase our enrollment to 40-45 graduate students. As our program grows, we have initiated a period of intense planning for a new Ph.D. program, which is absolutely essential for the Department if it is to continue to grow in quality and attract the very best new faculty in the country to take positions in the Department.

Professor Gordon E. Martin decided to retire after 40 years of service to the University. We wish Gordon and his wife Millie many years of continued good health so that they may enjoy their retirement. We are embarking

Information Sought On Phi Alpha Lambda

Prof. Harrison Streeter, chairman of GE scholarship and awards committee, is seeking information concerning Phi Alpha Lambda, a former honor society at UIUC.

His interest was aroused by a recent letter from **Jean E. Lattan**, '32, asking what happened to Phi Alpha Lambda. Lattan was initiated into the honorary on April 10, 1930.

Prof. Streeter says, "When Gamma Epsilon (the present honorary for General Engineering students) was founded in 1962, the Dean of Students' office provided information about Phi Alpha Lambda that had existed on campus in the 1920s and early 30s.

"Included in that information was a letter from Dean Tommy Arkle Clark dated sometime in the '30s that noted that Phi Alpha Lambda existed for 'engineers generally' and had no special relationship to the general engineering program."

In his letter, **Lattan** said Phi Alpha Lambda was founded on April 7, 1925 and was an honorary for students in the general engineering program (it was not a separate department then). He further stated that the organization was still active at the time of his graduation in 1932.

"We would like to learn more about the history of Phi Alpha Lambda," **Prof. Streeter** says. "If anyone can enlighten us further we would like to hear from you."

Lattan's certificate also bears the names of William Schute, president; and R.H. Anderson, secretary.

on a national search to find replacements for Professor Martin and Professor John Hipskind, who retired last year.

We added a new staff member last spring. Mr. Kevin Carmody is our new Manager of Systems Services. Kevin comes to us from the Administrative Information Systems and Services (AISS) of the University of Illinois and is a graduate of the University of Illinois and Sangamon State University. Kevin's responsibilities are to manage the computer-based instructional laboratories and provide system consulting and direction to the Department in its development and management of computer-aided instructional laboratories and in the development of research laboratories. Kevin takes over many of the administrative responsibilities that were shouldered by Professors Pleck and Woodley in the early development days of our computer-aided design and drafting laboratories in addition to other departmental administrative functions. We welcome Kevin to the Department and are confident that he will provide the leadership necessary to sustain and enhance our excellent laboratories.

The Department is in a period of intense change. We will be adding a number of new faculty in the next 3-5 years, revising our undergraduate curriculum, and developing a Ph.D. program. To do this requires a lot of hard work and coordination between our undergraduate and graduate programs. We do this ultimately for our students for they are the reason that we are here.

Thomas F. Conry
Professor and Head



THE STUDENTS' VIEW

From the Illinois Society of General Engineers

Summary Issue No. 89-1

November 1989

Sunstrand's R.W. Reynolds

Richard Reynolds, BSGE '53, MSME '58, directs mechanical research at Sundstrand's Rockford facility. He spoke at ISGE's October meeting.

He stressed that the engineer of tomorrow must have breadth. 'Simultaneous' or 'concurrent', engineering demands expertise in design concepts, materials and manufacturing processes.

Among its products, Sundstrand produces ram air turbines for emergency power and 'black boxes' or flight recorders. Aircraft power systems have decreased weight from 8 lbs per kva generated in 1940 to 1 lb per kva today. In the same period, power system reliability increased from 2000 to 16,000 expected hours of operation between failures.

Reynolds predicts that further weight savings will rely on composite materials. However, although they are 1/2 the weight of magnesium, composites pose manufacturing problems.

Reynolds has submitted 40 patent disclosures and is active in technical societies. He is a member of the U of I's College of Engineering Advisory Board, serves on U of I foundation committees and is currently president of GE Constituent Alumni. He was the recipient of the '88-'89 Gamma Epsilon Distinguished Alumni Award.

His son, Greg, graduated BSGE in 1982.

Freshmen Survival Kit

Despite the torrential downpour flooding the Boneyard and most of Green Street, ISGE held its second annual fall Freshmen Survival Kit Sunday, August 27th. The night started with a brief introduction by Liz about the Department and most especially ISGE. Following that Prof. Wozniak gave tips on study habits, ("Trash your T.V."), using your adviser and other helpful information. Afterwards the group went to the student lounge to feast on an abundance of food and drink provided by ISGE and the department and served by many G.E. seniors. After everyone got something to eat, we broke into two groups, technical and non-technical, where we finished eating. During that time the seniors were able to give advice and answer any questions people had. Many thanks to our seniors who came, the department for sponsoring it and most especially the brave freshmen who showed up.

Specifically What?

On Sunday, October 1st ISGE held its second "Specifically General Engineering Night." "Specifically G.E." gives freshmen insight into the opportunities available to G.E.'s and hopefully clears up some myths concerning our major. A video was shown highlighting some of the G.E. 242 projects from last spring. These projects are industry sponsored solutions to real-life engineering problems. As usual, food was served afterward.



Dean Schowalter, Liz Auer, September 19 address to ISGE.

Schowalter Speaks

"The University is a panorama for learning rather than a place to be taught" according to Dean Schowalter's Sept. 19 address to ISGE's.

"Engineering is problem solving," he said. "Engineering principles are a springboard, but thinking, inductively, eliminating one problem after another, is the definition of a successful career."

The Dean discussed positive and negative fallout from his view of the U of I as a "modern, public, research university."

On the positive side, two-thirds of college funding is grant, gift, institutional and corporate money. Promising investigators, well known scholars and professors who do outside consulting bring in funds and contacts with industry. Outside consulting brings new dimensions to teaching while major grants provide laboratories for further research. He felt that our reputation as a research university also improved employment prospects.

On the negative side, the dean recognizes that "teaching and research can be in opposition to each other." Outside consulting or research could reduce the professor's inclination to teach. He admits that we could lose some superb teachers because they have insufficient research involvement. "Research is part of a professor's job description."

The Dean also made clear that "Undergraduate education is *one* function of the University." He argues that there is a strong coupling between a research university and the economy of a state as is the case with the University of California and "Silicon Valley." The University must also fulfill its mandate to serve the needs of the state. By attracting the finest research faculty, fully equipping modern labs and screening for the brightest and most able students, the Dean hopes to allow the U of I to develop into the top modern public, research university in the country.

A video cassette recording of Dean Schowalter's Sept. 19 presentation may be purchased from ISGE.

The Students' View: A Reply To The Dean

Although we are only undergraduates, we, too, would like to focus the U of I's image as a "modern, public, research university." We offer the following points for consideration:

—Since the state supports only 22% of our education costs, would our image as a *research* university be enhanced if only 22% of the professors were assigned to teach?

—Noting the Dean's comment that the busy researcher could always post office hours at 2 a.m., could we trouble this *modern* university less if we took undergraduate education by correspondence?

—Recognizing that superb teaching is not sufficient for tenure at this *public* university, would it be less distracting if teacher evaluations were just sent directly to the Governor?

As undergraduates, teaching is an important component of our education. We hope our views do not put us on the "Dean's List."

—While we realize that it is research that most enhances the reputation of the university, we the students feel that a university is an institution for learning, built for students. Most importantly, we students are paying to be taught, through tuition and taxes, thus

Yes, I want to become an

ISGE ADJUNCT

I am enclosing \$5.00 for '89-'90 mailings.

Send ISGE's *The Students' View* to

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone () _____

Engineering Open House To Be Held March 2-3

The annual Engineering Open House is scheduled for Friday and Saturday, Mar. 2-3, 1990. The theme for this year's event will be "Dare to Discover."

Representative from ISGE is Eugene Delfiaco, Rockford, Il.

Each year hundreds of high school students, parents, faculty advisers and the public from throughout the state visit the campus to attend the annual event.

ISGE Gets New Office

During last summer Room 205 T.B., last year's ISGE office, was converted to office space for TAs. The ISGE office has moved to Room 402 T.B. It will be staffed during noon hours again this year. Our new phone is 244-2908. Come see us. We have T's, sweats, iron-on logos and disks.

we are paying the salaries of our teachers, at an average of \$7 per hour of class. We therefore feel that an emphasis on teaching should be expected from this institution of learning.

Please detach and mail to:

ISGE
Department of General Engineering
104 S. Mathews
Urbana, IL 61801

Scholarships Available at British Universities

CHURCHILL SCHOLARSHIPS, Cambridge University

These scholarships, established by the Winston Churchill Foundation, enable outstanding students in engineering, mathematics and science to enroll in a one-year graduate program at Churchill College, Cambridge University. Eligible students are U.S. citizens between the ages of 19 and 26, who expect to have a bachelor's degree from a U.S. college by September 1989. The scholarships provide payment of all College and University tuition and fees, a living allowance, and a travel allowance. There are 10 awards annually. All applicants must be nominated by the campus representative.

GEORGE C. MARSHALL SCHOLARSHIPS in Great Britain

This program provides scholarships for graduates of U.S. colleges to study for a degree from a university in the United Kingdom for a period of at least two years.

Eligible students may be from any field of study, and must be U.S. citizens and less than 26 years old. The scholarships provide payment of tuition, a living and book allowance, transportation to and from the United Kingdom, and payment of limited approved travel in connection with courses of study. Thirty scholarships are awarded annually. All applicants must be endorsed by the Chancellor, on the recommendation of a faculty committee.

RHODES SCHOLARSHIPS, Oxford University

Rhodes Scholarships are for study at Oxford University only, and may be for a degree in any field offered by that University. Two years is the minimum period and three years the maximum for which a Rhodes Scholarship can be awarded. Applicants must be U.S. citizens between 18 and 24 years of age as of October 1988 and unmarried. Graduates and undergraduates who expect to have a bachelor's degree by October 1989 are eligible. The award includes payment of tuition and fees as well as a living allowance. Thirty-two scholarships are awarded annually.



Mark W. Spong is developing so-called intelligent robots capable of adapting to changes in their environment.

Chinese Conference Provides Extra Thrills For Dobrovolnys

Jerry S. Dobrovolny, emeritus professor of general engineering and former department head, and his wife, Jo, were in China for a conference at the University of Beijing in May during the student demonstrations for political freedom and human rights.

An account of their experiences appeared in the September issue of the *Illinois Alumni News*.

In his "Reflections on Beijing," Dobrovolny wrote about an encounter with a member of the CBS-TV crew who was there primarily to cover the Gorbachev visit and "was quite excited now they were covering a revolution."

On their first free day in the city, Dobrovolny recalls being stopped many times on the couple's way to a shopping area five miles away from their hotel "by hundreds of people marching toward the square carrying signs and banners and wearing headbands with Chinese characters on them.

"There were thousands of people lined along the streets and on the overpasses cheering the marchers on. We were stopped many times as marchers, trucks, and bikes created a gridlock. The entire attitude was one of a festive holiday mood with everyone giving the "V" sign with their fingers," Dobrovolny wrote.

A day later, May 18, rumors began to circulate about the power struggle between the hardliners and the liberals and that the Army was being ordered in and martial law would be imposed.

When he asked their English-speaking Chinese guide and employees at their hotel what the students wanted when they spoke of democracy, "The only consistent answer I got was a free press and a meeting with the leaders. As far as any suggestions or plans on how to implement democracy in China, there was none."

The Dobrovolnys left without much incident on May 21, though they learned over CNN that all major roads into Beijing had been barricaded.

Mark Spong Collaborating With Mexican Scientist on Robotics Research

by **Catherine Foster**
Science Editor, *Illiniweek*

A UI scientist and a Mexican university researcher will be sharing experiments and research results in an effort to develop advanced robots for industrial work.

Mark W. Spong, UI professor of general engineering, and **Romeo Ortega**, an engineering professor at the Universidad Nacional Autonoma de Mexico, will be collaborating on industrial robotics research with a grant from the National Science Foundation and its counterpart in Mexico, Consejo Nacional de Ciencia y Tecnologia.

The UI research centers on "adaptive control of robots — using a computer to control robot motion and performance under a range of uncertain conditions," Spong said.

The concept of industrial robots is an important one for "jobs that require tasks humans can't accomplish," he said. For example, "there are some chores in a nuclear power plant that are too detailed or too dangerous for human workers."

"Developing so-called intelligent robots that are capable of adapting to changes and uncertainties in their environment is one of the goals of robotic research," Spong said.

For example, if a worker needed to move varying payloads using robots, an adaptive control algorithm — the rules the computer follows to make decisions — could immediately estimate the mass of the payloads and provide the correct instructions to the robot.

"Right now, we're working mostly on theory and computer simulations, but we also plan to test the theory on robots here," Spong said.

The mechanical arms and other industrial robots are being designed by Spong's doctoral students and built in the UI's machine shop.

The move to greater use of industrial robots is an important one for the Mexican economy, hence that government's interest in the project, Spong said.

"Mexico needs to compete more vigorously in the world marketplace, and robots help do that," he said.

Ortega is working on a similar project. Along with the exchange of research findings, he is collaborating with Spong on a textbook on adaptive control of manipulators.

Funding for Spong's research and travel to Mexico comes from the National Science Foundation and the U.S. Army Construction Engineering Research Laboratory.

Prof. Scott Burns

A conference presentation entitled "Graphical Representation of Design Optimization Process" was given by **Prof. Scott Burns** at the Fifth International Forum on Micro-Based CAD at the Research Triangle Park, N.C., July 19-21.

He also has published two papers:

— "A Graphical Characterization of Diverse Engineering Design Processes," in *NCGA '89 Conference Proceedings*.

— "The Structure of the Munsell Color System in Fundamental Color Space," in *Journal of Color Research and Application*, with **Profs. J. Cohen** and **E. Kuzhetsov**.

New Research Lab . . . (Continued from page 1)

A particular concern is the flow and management of cutting tools, whose population could exceed 700 tools within the cell at a given time. Indeed, the tool management problem is so complex that other corporate sponsors, including Caterpillar, Inc. have donated financial resources through the University of Illinois' Manufacturing Research Center to support this effort.

An animated version of the simulation for the RIA has already been generated and the preliminary tool management strategies will also be demonstrated with the real-time simulation algorithm at the AMRF open house. Eventually, the RIA simulation model will also be incorporated within the real-time simulator.

The real-time simulator, however, is but a single component of the real-time production scheduler. The complete scheduler will require several other computing functions to operate concurrently to support the overall decision-making process. The proposed algorithm would also provide for the continuous implementation of the currently selected production schedule even while alternative schedules are being evaluated.

The computer farm provides a bread board for design these concurrent computing processes.

Recently, Motorola, Incorporated has become a major collaborator/supporter of the implementation of the entire scheduling algorithm. Specifically, Motorola, Inc. donated one of their mini computers to provide an advanced processor/network server for the computer farm. Ultimately, the Motorola computer will provide a gateway to an advanced parallel processing computer while the Macintosh II's which now comprise the computer farm will provide graphical interface for the human participant into the real-time decision-making process.

In addition to the donating equipment to the MSL, Motorola, Inc. has named Thomas Tirpak as a recipient of a Motorola Scientific Advisory Board Fellowship to support his doctoral research efforts of developing control strategies for implementing the production schedules and has also provided an additional research grant support to another student through the University of Illinois' Manufacturing Research Center.

Real-time production scheduling is but one application of real-time decision-making. Other applications would include real-time air traffic control, real-time vehicular traffic control, real-time emergency crisis management, real-time battle management and the Strategic Defense Initiative. The decision-making discussed above addresses a short planning horizon.

Strategic decision-making is being addressed and represents the second major research thrust for the MSL. In particular, under the direction of Prof. Davis and Prof. Daniel S. Thompson, Larry White (a M.S. graduate in General Engineering and current doctoral student in Business Administration) is now investigating new stochastic decision-making techniques for aggregate production planning. These algorithms, like their real-time decision-making counterparts, will require significant concurrent computing resources.

The third major research thrust for the MSL is the development of a theoretical foundation to coordinate the actions among several hierarchical decision-making levels. A particular application is the development of a

Faculty Notes

Prof. Manssour Moeinzadeh

Prof. Manssour Moeinzadeh was session chairman and organizer for the 1989 Annual Conference of the American Society for Engineering Education (ASEE), Biomedical Engineering Division, entitled "Rehabilitation Engineering Curricula" held at the University of Nebraska, Lincoln, June 25-29. In this session, Profs. Moeinzadeh and Mark Strauss presented a joint paper, entitled "Rehabilitation Engineering at the University of Illinois." Also at the ASEE meeting, Prof. Moeinzadeh was reelected to the executive board of the Biomedical Engineering Division of ASEE.

During the summer, Prof. Moeinzadeh presented invited lectures and seminars on his current research projects at the Amirkabir University of Technology, Iran University of Science and Technology and Sharif University in Tehran, Iran. On his return to the United States, Prof. Moeinzadeh presented an invited talk at the University of Tokyo, Sports Sciences department, and visited Prof. Mitsumasa Myashita's world renown Sports Sciences Laboratory where he exchanged the research results concerning biomechanics aspects of human movement and possibility of some joint research projects.

Profs. Moeinzadeh and Strauss have received a \$4280 joint research grant from the bioengineering program of the University of Illinois for their research project entitled "Efficiency of Wheelchair Propulsion: A Modality for Exercise Prescription."

Prof. Moeinzadeh presented a paper at the 13th annual meeting of the American Society of Biomechanics held at the University of Vermont, Burlington, Aug. 23-25. His paper entitled, "Wheelchair Locomotion Specific Arm-Crank Ergometer." It was co-authored by Profs. H.W. Knoebel of the GE department and B.N. Hedrick of the Division of Rehabilitation Education.

theoretical foundation for computer-integrated manufacturing. Prof. Davis is again collaborating with Dr. Albert Jones of the AMRF in this effort. They recently contributed an article to the special topics issue of *IEEE Trans. on Systems, Man and Cybernetics* and co-edited a special issue of *Computer-Integrated Manufacturing*. Using the future concurrent processing capabilities of the MSL, they hope to develop new experimental and computational techniques for hierarchical simulation.

The MSL described here represents only an initial implementation of what is perceived to be a major research thrust for the Department of General Engineering. Ideally, the future will provide for five or more faculty collaborating with a population of 10 to 15 graduate students. Corporate interactions will likely be extended to provide for corporate research partnerships at the MSL.

Future research will provide for a mixture of both theoretical and applied implementations of the developed algorithms. The applications themselves will address other critical problem areas in hierarchical and/or real-time decision making beyond manufacturing systems.

Faculty Notes

Prof. Osman Coskunoglu

Prof. Osman Coskunoglu has been appointed by Vice Chancellor Judy Liebman as co-chairman of a campus-wide Committee on Decision Theory. The group is charged with coordinating multi-disciplinary research and teaching in the Campus on Decision Theory and Operations Research.

Prof. Osman Coskunoglu spent his sabbatical (Sept. '88—Aug. '89) with the Computer Science Department of the University of Milan, Italy. A research group in this department has been developing a new programming language, based on ProLog with meta-facilities (meta-reasoning, meta-evaluation and meta-knowledge). Coskunoglu is conducting research on Computational Theory of Decision Making and Problem Solving demands as language with a flexible control strategy. His collaboration with the research group involved determining and developing those facilities that need to be included into the new language. In the process of this collaboration, Coskunoglu also supervised a thesis.

During his sabbatical, Coskunoglu also travelled to a number of universities in France, England, Denmark and Austria to explore and discuss the related research efforts in Europe and to speak.

Coskunoglu will return to University of Milan for five weeks during the semester break as a follow-up.

Prof. Coskunoglu with colleagues from the Computer Science and Psychology departments, organized a workshop entitled, "Role of Knowledge in Decision Making." Leading researchers from throughout the world attended. Papers presented at the conference will be published in the May, 1990 issue of the IEEE Transactions on Systems, Man and Cybernetics.

One of the papers is co-authored by Coskunoglu and Elke Weber, Center for Decision Research, University of Chicago. It is entitled, "Descriptive and Prescriptive Models for Decision Making: Implications for the Development of Decision Aids."

Prof. Mark Spong

The following grants have been received by Prof. Mark Spong:

—\$14,000 from the Illinois Space Institute and the Coordinated Science Laboratory for "Teleoperator Control in Space Applications":

—\$8,300 from the National Science Foundation U.S.—Mexico Cooperative program "Adaptive Control of Robots";

—\$22,000 from the University of Illinois Manufacturing Research Center for "Force Feedback in Robotic Assembly Operations" and

—\$10,000 University of Illinois Research Board for "Feedback Linearization of Flexible Joint Robots."

Prof. Mark Spong will present an invited paper at the 1989 IEEE Conference on Decision and Control, Tampa, Fl., in Dec., 1989. It is entitled "A Discrete Time Observer for Flexible Joint Robots."

He also was an invited speaker at the Workshop on New Methods and Applications of Distributed Parameter Control Systems, in August, 1989, at the University of Minnesota.

Luce Scholars Program Available to Graduates

Exceptional alumni are encouraged to apply to the Luce Scholars Program, a one-year paid professional apprenticeship in Asia, offered annually by the Henry R. Luce Foundation, New York. The program is open to recent graduates from all fields and is designed to provide participants with both a broader professional perspective and a sharper perception of Asia, of America, and of themselves.

Applicants must be American citizens, under 30 years of age, with no previous experience in Asia. The ideal candidate has both outstanding academic and professional credentials, as well as a commitment to and demonstrated leadership in his/her field. Applicants need not presently be on campus. Language proficiency is not necessary.

Prof. Juraj Medanic

The Sundstrand Corporation has continued its support of the research in the Design of Multivariable Controls carried out by Billy Diong under the supervision of Prof. Juraj Medanic with a \$27,000 research assistantship for the 1989-1990 academic year.

Prof. Juraj Medanic is a co-principal investigator (with Prof. T. Basar and Prof. W.R. Perkins of the Dept. of Electrical and Computer Engineering) of the unit on "Decentralized and Distributed Control" in the current 3 year (1990-1992) Joint Services Electronics Program grant. The research is conducted in the Coordinated Science Laboratory and the unit is funded at \$90,000 annually.

Prof. Juraj Medanic presented the following papers at conferences this summer:

—"Robust Stabilization and Disturbance Rejection for Uncertain Systems by Decentralized Control," (co-authored with R.J. Veillette and W.R. Perkins), presented at the Workshop on the control of Uncertain Systems, Bremen, June 12-15, 1989.

—"An Algebraic Riccati Inequality and H_∞ -norm bounds for Stable Systems" (Co-authored with R.J. Veillette), presented at the Workshop on the Riccati Equation in Control, Signals, and Systems.

Prof. Juraj V. Medanic is a co-author of two regular and one short paper to be presented at the forthcoming Conference on Decision and Control, Dec. 13-15, Tampa, Florida.

Other papers include:

J.V. Medanic, W.R. Perkins, Z. Uskokovic, and F.A. Latuda. Design of decentralized projective controls for disturbance rejection.

R.J. Veillette, J.V. Medanic, and W.R. Perkins. Robust stabilization and disturbance rejection for systems with structured uncertainty.

R.A. Paz and J.V. Medanic. A Riccati-based H_∞ norm optimization algorithm for robust low-order controller design.

R. Veillette and J.V. Medanic. H_∞ -norm bounds for ARE-based designs. *Systems and Control Letters*, 1989.

R.A. Paz and J.V. Medanic. Design of disturbance attenuating controllers: a Riccati-based H_∞ norm optimization algorithm. 1989. Accepted for *Automatica*.

R.A. Ramaker, J. Medanic, and W.R. Perkins. Strictly proper projective controls for disturbance attenuation. 1989. To appear in *International J. Control*.

ALUMNI NOTES

1932 Jean Edward Lattan, Lombard, IL, who has retired, recently contacted the Department seeking information concerning Phi Alpha Lambda, a former honor society. (See item elsewhere in this issue.)

1942 Otto C. Linhart, passed away early in 1989 according to word received by the Department.

1950 Fred S. Potter, Warsaw, IN, has retired as vice president of manufacturing of Dalite Screen Co., Inc., Warsaw, IN. He served 11 years with the firm as chief engineer and the past 15 years as vice president.

1955 Francis P. Smith, Sherman Oaks, CA, has written that he is involved in cleaning the oil spill near Valdez, AL. He is an assistant supervisor with VECO, Inc.

1956 Richard D. Jonson, Bloomfield hills, MI, has started a new firm, Interim Management Resources, Inc. which supplies temporary management and executive personnel. Jonson who retired from United Technologies Corp. in 1987, was named Distinguished GE Alumni in 1987.

Allyn E. Webb has moved to St. Louis, MO, from Tulsa, OK, to become Director of Operations Support of General Dynamics Services Co. of St. Louis.

1957 Charles J. Kustner has moved to Waukesha, WI. He is with Corporate Investment International, Brookfield, WI.

1959 Jerry H. Hogan visited the Department in March. He is vice president for operations for MCI Telecommunications, Inc., Richardson, TX.

1960 Melvin F. Jager, JD '62, UIUC, Chicago, is a partner in the law firm, William, Brinks, Olds, Hofer, Gilson and Lione, Chicago. He is author of "Trade Secrets Law."

1964 Robert E. Seyler, MBA '68, U. of Mich., is vice president of engineering and management systems, Warner's, Bridgeport, CT. He writes: "yes, bras are engineered!" Seyler resides in Huntington, CT.

1967 Wayne A. Weber, MBA '68, Purdue, has accepted the position of General Manager, Carthage Water and Electric, Carthage, MO.

1969 Thaddeus Stanley Figus, JD '72, UIUC, has established and become president of a law firm, Corporate Legal Advisors, Minneapolis, MN. The firm provides "on-site" general counsel services to businesses which do not have need for full-time in-house legal counsel.

Robert A. Lehmann, has established a new firm, Edina Realty, in Plymouth, MN. He is a resident of Robbinsdale, MN.

1970 Paul Stene Litherland, MS '71 TAM, has been named manager of The Applied Technology Engineering Department at The Oak Ridge (TN) National Laboratory. He has been with ORNL since 1975.

1972 Samuel E. Eskridge, Branford, CT, has accepted a position as Manufacturing Engineer with General Electric Co.—Electrical Distribution and Contract Group, Plainville, CT. His responsibilities include coordination of new product tooling programs, and technical consultation on design issues concerning plastic and metal components.

Jeffrey F. Voelz, Andover, MN, has been appointed Director of OEM Sales, Engine Division, ONAN Corp., Minneapolis, MN. Voelz reports he has moved from engineering to sales and marketing over the past five years.

1974 Kathryn A. Davis, MS '75, is vice president for marketing and planning with Merritt and Harris, Inc. in New York City.

Larry Golden, JD, Chicago-Kent '77, of Wheeling has been appointed general patent counsel for Square D Co., Palatine, IL. He has been with the firm since 1977 when he was appointed a staff attorney.

Tom W. Timmerman, MBA '89, has been appointed Production Manager of Carlisle (PA) Syntel System.

1975 Alan Raymond Belair has accepted the position of Assistant Manager—Air Separation Plant Design for Union Carbide Industrial Gases, Inc. Tonawanda, NY.

Hardin T. James, Jr., MBA-Management '89, U. of Wis., is Manufacturing Engineering Group Leader, Carnes Co., Verona, WI. He resides in Mt. Horeb, WI.

1976 Dean E. Anderson has moved from Holland, IL to Valparaiso, IN. He is employed by USX, USS Division, Gary Works, Gary, IN.

Brian M. Briggs, MS Computer Eng. '77, Rensselaer Polytechnic Inst., of Chicago has left his position as a Systems Engineering Manager at IBM. He is now Senior Principal in the financial services for The Information Consulting Group, Chicago.

Stephen A. Litchfield, JD '79, John Marshall Law School, has been appointed Chief Commercial Counsel for Square D Co., Palatine, IL. He joined the firm in 1981 as a patent attorney.

Bob Weibel of Longwood, FL with his wife and four children visited the UIUC campus in June. He is Assistant to the District Service Manager, Power Generation Service Division, Westinghouse Electric Corp. Weibel has served in many overseas assignments including Libya, Taiwan, Korea and Spain.

1977 Bradford W. Dickson has been transferred by Dresser-Rand Co. from Utah to Fullerton, CA as Sales Engineer; he will handle a few major accounts for the firm in Southern California. He resides in Lake Forest, CA.

Caleb H. Didriksen, JD '82, Tulane, has opened his own Corporation Law Office in New Orleans, LA. His principal client is New Orleans Public Service, Inc., a subsidiary of Middle South Utilities.

Daniel N. Donahoe of Livermore, CA, has been named Section Manager—Mechanical Engineering, Teledyne CME, Santa Clara, CA. He writes that he is still taking engineering at a local university.

William Payden has been promoted to lieutenant with The City of Miline (IL) Fire Department. He trains other firefighters in addition to his regular duties.

1979 David J. Coulombe, MBA '85 DePaul, has been named manager of CPE and CEV engineering, Reliable Electric, Franklin Park, IL. He resides in Skokie, IL.

1980 Eugene V. Dunn, Jr., M. Mngt. '84, Northwestern, MA '89 U. of Chicago, has moved from Aurora, IL, to Rockville, MD, to accept a position as Marketing Manager for Japan, Fusion Systems, Rockville, MD. The firm produces imaging equipment to the graphics arts industry and UV Curing Systems.

J. Brian Galley has been appointed Project Engineer, Air Pollution Engineering, RMT Inc., Madison, WI.

Douglas P. Goetz, Ph.D. (Mech. Eng.) '88, Texas A&M, has been named senior mechanical engineer with 3M, St. Paul, MN. His responsibility with the 3-M Industrial and Electronic Sector Laboratory is research and development on aerospace composites primarily dealing with fracture behavior.

Silvana A. Medina, MBA '84, Harvard, has moved to San Diego, CA. She is product manager, Pacific Data Products, Inc., San Diego, dealing with products of networking technology.

John W. Peterson, Combat Systems Officer with the U.S. Navy has been promoted to Lt. Commander and awarded two Navy Commendation Medals. His present assignment is on the guided missile destroyer USS Callaghan, based in San Diego, CA.

David A. Thompson, MD '85 UIC, has been appointed emergency physician, MacNeal Hospital, Berwyn, IL. He resides in LaGrange, IL.

Dwight M. Woodbridge is program manager for Specialty Vehicles at Buick-Olds-Cadillac GM, Flint, Mich. He is responsible for design, test, assembly, and certification of specialty vehicles. Woodbridge also is a professional formula 2000 race car driver, competing in Canadian Pro f-2000 races.

1981 Dave Bretsche, MBA '85, U. of San Diego, has accepted the position of manager—Service Center US for BW/IP International-BW Seals. Bretsche resides in Naperville, IL and works out of the LaGrange, IL office.

Kirk W. Langford of Lake Charles, LA is currently stationed in Port Harcourt, Nigeria. He is area Technical Manager—West Africa, for Atlas Wireline Services, an oil service company, Houston, TX.

Brian Lilly, MS '84, Ph.D. (AAE) '89, is president of ANT Technology, Urbana, IL. He organized the firm to market various products he is developing from his research.

Matthew John Linsner has become service manager of Citiwide Mechanical, Inc., Urbana, IL.

Jeanne E. Weber, M.S. (Ind. Adm.) '89, Carnegie Mellon, has been promoted to Senior Program Control Specialist at AEG Westinghouse Transportation Systems, Pittsburgh, PA. She resides in East McKeesport, PA.

1982 Scott A. Jennings, MS '83, has accepted a promotion as District Manager, Network Architecture Planning, Illinois Bell Telephone, Chicago.

1983 Edward J. Klinenberg, MS (Biomechanical Engr.) '85, Northwestern, is stationed at Mather AFB, CA as Chief of Bioenvironmental Engineering Service. He is responsible for coordinating in-

dustrial hygiene surveillance, drinking water and radiological protection for the 6,000 personnel stationed at Mather AFB.

Samuel G. Papandreas, DDS '89, MS (orthodontics), Baylor, is a practicing dentist at Cleveland, OH.

Daniel R. Smith of Detroit, MI, has been promoted to System Administrator for a divisional warranty computer system for Cadillac Division, GMC. He is responsible for analysis of service repairs for the country and reporting his data.

Gary A. Voyda, MBA '89, U. of Bridgeport, is a sales engineer, Allen-Bradley Co., Milford, CT. He resides in West Haven, CT.

1984 Joseph Kann, MS (Mnf. Eng.) U. of Wis., is a project engineer with Allen-Bradley, Milwaukee, WI.

David L. Lukens of Topeka, KA, has been assigned as dedicated engineer to Kansas Power and Light, Combustion Engineering, Englewood, CO.

Gregory D. Morf, Ph.D. (Ag) '89 Stanford, writes that he has left the business world to join the Peace Corps. He has been assigned to Thailand.

1985 Matthew F. Fouck, MS '87, has been promoted to Group Head, Antenna Systems Product Line (CAD support group) Hughes Aircraft Co., Los Angeles, CA. He is living in Redondo Beach, CA.

Bradley G. Lane, Downers Grove, IL, is a patent attorney with William, Brinks, Olds, Hofer, Gilson and Lione law firm, Chicago.

Doug C. Williamson is a field sales representative with Compre Microelectronics, Inc., Fremont, CA. He lives in San Jose, CA.

1986 Michael F. Gasick, MS (Mech. Eng.) '87, U. of Co. (Berkeley), is a research engineer, McDonnell Aircraft Co., St. Louis, MO.

James A. Hoexter of Northbrook, IL, is a sales engineer with Westinghouse, Elmhurst, IL.

Lawrence M. Kaplan, JD '89, has been employed as an associate attorney with William, Brinks, Olds, Hofer, Gilson and Lione, Chicago.

John Matthew Lach is an investment real estate broker with Marcus and Millichapp, Chicago. He resides in Arlington Heights, IL.

Mark A. Krull, JD '89, U. of Texas, has been appointed patent attorney with Merchant and Gould, St. Paul, MN. He lives in Woodbury, MN.

Dina Sheathelm Scott has been promoted to Account Loss Control Representative, Allstate Insurance Co., Rolling Meadows, IL.

Andrew W. Sigle is studying toward a MBA at the U. of Chicago. He is Supervisor of Operations with AT&T, Chicago.

1987 Mary Larsen Bouxsein has been awarded a MS (Mech. Eng.) '89, at Stanford University. She is continuing her graduate study.

Frederick William Jewell and his wife, Julie A. Furmanek Jewell are both employed by Andersen Consulting, Chicago. They both received their B.S. degrees in '87 and M.S. in '89 from UIUC. They were married April 22, 1989.

Matthew Alan King, MS '89, is an associate engineer with General Dynamics, Electric Boat Division, Groton, CT.

Ellen McRaith has been employed as a staff consultant with Andersen Consulting, Arthur Andersen Co., Chicago.

John P. Mitola is a sales engineer with York Int., Wheeling, IL.

Eric D. Odden is employed as a project engineer with Robert Renwick and Associates, Inc., Ottawa, IL.

Anthony L. Schaff, Louisburg, NC, has been named a process engineer, Abbott Laboratories, Rocky Mount, NC.

1988 Craig S. Agney is employed in the Chemical-Materials Leadership Program of GE Plastics, Pittsfield, MA. He changes assignments every six months and is currently in application development. He also will be working in finance, purchasing, marketing and field sales.

William Daniel Leonard, MS '89, Columbia U., is a project engineer with Barnes & Reinecke, Inc., Elk Grove, IL., designing semitrailers for the military. Also as a freelance science writer, he has two stories in the Sept. '89 issue of *Final Frontier Magazine*.

David J. Mears, Round Lake Beach, IL, has been promoted to Ensign and gone on active duty with the NROTC Unit at UIUC.

Edward Mathew Karls has accepted a position as design analysis and light truck engineer with the Ford Motor Co., Dearborn, MI. He resides in Ypsilanti, MI.

Therese M. Villegas has accepted a position with General Motors—Packard Electric Division. Her current assignment is as an application engineer in Warren, OH. She is in a three-year rotational program and will next be assigned in Texas and then in Michigan.

Graduate Advisory Committee

Members of the 1989-90 Graduate Student Advisory Committee include: Eric Hedlund, Mt. Prospect; Shelly K. Morgan, Buda; and Richard and Robert Sesek South Holland. The committee meets monthly with GE Department Head Thomas F. Conry.

Retires from GE Department

Prof. Gordon E. Martin, a faculty member in the Department of General Engineering since 1953, retired effective Aug. 20, 1989. He received a B.S. in 1948, M.S. in 1949 and Ph.D. in 1961, all from UIUC. Prof. Martin taught design courses including matrix methods of structural analysis and digital simulation of continuous systems. He continues to reside in Urbana.

Gamma Epsilon Names 1989-90 Officers

Scott W. Cousins, Northbrook, has been elected president of Gamma Epsilon for the 1989-90 school year.

Other officers include: Linda M. Gogola, Oak Forest, vice president; Elizabeth A. Hausler, Plano, secretary; Gregory G. Davis, Belleville, treasurer; Brian L. McKay, Elgin, director; and James Lee, Northbrook, publicity chairman.

Prof. Harrison Streeter is faculty adviser.

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