INSIDE
Iowa grad makes clear-cut choice, pits right against might
The past few months have been eventful at the College of Engineering. We have seen many positive developments, a few of which I'll describe to you here.

First, our college was ranked among the nation's top 25 public engineering colleges by *U.S. News & World Report* in its annual ranking of engineering graduate programs, published in the March issue. We are particularly proud of this recognition for two reasons: This is the first time we have been ranked nationally by *U.S. News*; in addition, we are among the top four public engineering colleges with fewer than 100 faculty members to be ranked nationally. Such recognition is a tribute to the unusual quality and productivity of our students, faculty, and staff.

More good news came from the Institute of Hydraulic Research with the naming of Virendra C. Patel, professor of mechanical engineering, as director. We are most fortunate to have in Patel a new director who not only is internationally known for his research but also has won campus-wide acclaim for his commitment to both teaching and service.

Our students were the source of pride as they maintained the college's tradition of setting University of Iowa standards for quality and accomplishment. Our incoming class last fall not only had the best average ACT scores on campus, it also ranked well above the 90th percentile nationally and was the highest ranking class in college history. All indications are that the incoming class for fall 1994 is equally well qualified.

Among our 1994 graduates, Pranav Patel won one of the University's two Hancher-Finkbine Medallions, and Benjamin Dingel won one of 22 national Tau Beta Pi fellowships. No other public engineering college in the nation has produced more Tau Beta Pi fellowship winners since 1980.

College research productivity also reached an all-time high this spring. Having won an increase in external funding of about 30 percent over one year, the College of Engineering is one of the two most robust research enterprises on campus. For example, the Center for Computer-Aided Design (CCAD) alone accounted for $10 million in external funding and continues to demonstrate phenomenal growth. In addition, CCAD research has had a direct impact on industry: This summer, Professor K.K. Choi's Ford-sponsored research project led to a very rare event at Ford—modification in a Mercury Sable production-line vehicle (see story on page 8).

As I told you in the last issue of *Iowa Engineer*, College of Engineering alumni continue to make their mark after they graduate. In this issue, Jim Ashton's story illustrates the unusual accomplishments of just one family of Iowa engineers.

I am convinced that once the accomplishments of our alumni are documented, they will take their place as a College of Engineering hallmark equal to those set by the college's students and faculty. However, obtaining the necessary documentation is not a trivial task. After seriously considering less formal means, we have decided to publish a professional directory of all College of Engineering alumni as soon as possible. You should expect to be contacted during spring on this project.

Despite its limited resources and visibility, the college continues to surprise people with its outstanding accomplishments. Because we are neither large nor as well known as we should be, we plan to greatly increase our public relations efforts in the near future. In order for the college to continue to advance, it must make every Iowan aware of its quality and its value to the state and the nation. Your continued support in this long-term endeavor is essential.

Richard K. Miller
Dean, College of Engineering
Table of Contents

4 James Ashton's steady stand during crisis
When alumnus James Ashton discovered huge cost overruns at his company, he worked within channels to bring the matter to his superiors but got fired anyway. Ashton, who weathered the storm well, credits his Iowa upbringing and education for keeping him on the right course for the long run.

6 Adrianna Platt’s message for youngsters
Iowa’s Society of Women Engineers chapter shows schoolchildren what engineering can be like. Adrianna Platt knows how important it is for them to find out.

8 Faculty researchers’ quest for a better ride
K. K. Choi and Ford Motor Company design a quieter, smoother car; Tom Dingus conjures up a whole new approach to finding the way; and Jon Kuhl brings a brand-new realism to driving research.

14 Co-op program’s success
Joe Ehle takes time out from school to work at Quantum Chemical, in a partnership that benefits both parties.

20 Louis Landweber’s legacy
Long after retiring, the man who ‘made’ hydrodynamics at Iowa is still hard at work. A recent conference reunited him with some of his many colleagues and students.

23 1993 Honor Club contributors
24 Alumni class notes
25 In memoriam
26 College departmental notes
A decade ago his name and face graced the front pages of The New York Times, The Washington Post, and The Dallas Times Herald. In an era of bloated spending at government, corporate, and personal levels, he cried "excess." While individuals in other situations profited from going public, he worked diligently but quietly for change within a corporate structure. And when integrity sometimes seemed a waning grace, he proved its power.

Amidst a major corporate scandal, James Ashton calmly followed the mores he had learned as a child growing up in Davenport, Iowa, and honed as an undergraduate in civil engineering at The University of Iowa.

In late 1980 as a top executive of General Dynamics—the nation's largest defense contractor—Ashton uncovered massive cost overruns and delays in the company's development of the Trident and 688-Class submarines. He was a 13-year General Dynamics veteran who had begun as a senior engineer and later served as vice president of production, overseeing 8,000 employees and the production of fighter aircraft. By October 1980 Ashton had been promoted to assistant general manager over engineering for the company's Electric Boat Division.

**Company line versus reality**

"Shortly after I began the new position, I discovered that the public story about what was happening to General Dynamics' Trident program was far different from reality," Ashton says. "I decided I just couldn't go along."

According to General Dynamics' corporate line, the Trident and 688 programs were ahead of schedule and financially afloat. In fact, Ashton found, development of the nuclear ballistic missile submarine was at least five months behind schedule and the two programs were over their budgets by 250,000 man-hours—or $5 million—per week.

Although publicly acknowledging cost overruns is uncomfortable for corporate executives under any circumstances, the difficulty for General Dynamics was compounded by the fact that three years earlier, the corporation and the Navy had fought over excess costs incurred during the early phases of Trident and 688 construction.

In March 1981, five months after he assumed his executive role at Electric Boat, Ashton reported the management mess he had inherited to his immediate boss and to the corporate office. The response was silence. In November Ashton was fired. Shortly after that, his boss, P. Takis Veliotis, fled the country to Greece.

**The message and the messenger**

By 1983 the scandal had spilled into the press and the political arena. General Dynamics eventually wrote off losses to the tune of $130 million. Fugitive Veliotis was indicted for allegedly sharing in almost $3 million in kickbacks from subcontractors while he managed General Dynamics' shipbuilding operations.

"I struggled vigorously within the corporate structure," Ashton says, "and I got fired. But the worst disappointment for me was discovering that CEO Dave Lewis—a man I respected, a man who presented himself as a statesman in a powerful role—had been trying all along to torpedo me."

Ashton did not learn about Lewis' efforts to fire him until summer 1984, when the press published excerpts from a taped telephone conversation that took place in 1981 between Lewis and Ashton's boss, Veliotis. In the conversation, Lewis said he wanted to keep internal estimates of cost overruns under wraps and complained about Ashton "popping off...that we have a big cost overrun."

"I chose the politically treacherous path of providing an accurate assessment to the head of General Dynamics," Ashton says. "Even though I was fired, history has shown that I chose the right course."

Ashton dislikes the appellation of "whistleblower," insisting instead that he never tried to undermine the corporate structure of General Dynamics or sought personal aggrandizement by publicizing the scandal.

"Some people might fit that term," he says, "but it's not my style. Whistleblowers often circumvent the system and
are interested in publicity. My actions were internal and aimed at convincing those in charge of General Dynamics that they were on the wrong path. Only after the scandal came to light several years later and the taped conversation about my efforts was made public was I forced into the limelight. When people see a wrong being committed, it may be a disservice to immediately run to the press—that should be a last, not a first, resort."

Ashton credits his parents for instilling a sense of ethics in each of their children and adds that his value system was further enhanced by the culture and education he was exposed to at The University of Iowa.

"Both my parents and my college professors at Iowa always stressed the importance of business professionals exercising integrity," Ashton says. "It's basically a Midwestern value system that has served me well."

During his undergraduate years at Iowa, Ashton earned valedictory honors and 19 other awards and scholarships, including the Outstanding Senior Award and a varsity letter in cross-country.

"The University of Iowa was the best of all worlds for students," he says. "In a sense, the engineering college adapted to each of us by providing a flexible program that allowed undergraduates to take liberal arts and graduate engineering courses."

First taste of management

While still an undergraduate, Ashton had the opportunity to create and teach the first undergraduate computer course—using FORTRAN—taught at Iowa. He also worked as the head counselor for Quadrangle Residence Hall, a role he says gave him his first taste of management.

"Iowa was about as good an undergraduate environment as one could hope for," Ashton says. "During my later graduate studies at M.I.T. I came to realize that I had been much better prepared academically than my fellow students."

After graduating from Iowa in 1964, Ashton earned his (continued on page 6)
Integrity—continued from page 5

M.S. and Ph.D. degrees from the Massachusetts Institute of Technology and an M.B.A. from Harvard Business School.

He began working for General Dynamics in 1967, rising through the ranks as an engineer, manager, and vice president. Production of 200 F-16 aircraft under his tenure was ahead of schedule, on budget, and of exceptional quality.

After his confrontation with other General Dynamics executives about the Trident and his eventual dismissal, Ashton held executive positions at several large engineering firms, including Rockwell International. In 1983 he was invited by a former colleague from General Dynamics to become president of Healthdyne, a flourishing new company that manufactured warning monitors for infants at risk for Sudden Infant Death Syndrome.

Exonerated by federal probe

"Financially, the young company had really taken off," Ashton says. "After two months I discovered why. The top executives had cooked the books. After I refused to acquiesce, I was fired."

Because a member of a board of directors cannot be fired without a Securities and Exchange Commission probe, the company's accounting irregularities and deceptive practices were eventually uncovered by the SEC and made public.

"I made front page of The New York Times twice in 1984," Ashton chuckles. "First when the news about General Dynamics scandal finally broke, and soon afterward when I was dismissed from Healthdyne. For a while, I was beginning to wonder about my luck in the corporate world."

Two highly public scandals within two years convinced Ashton in 1984 to establish his own consulting firm, Ashton and Associates. By the following year, however, he was back in the corporate mainstream, as director of manufacturing for Schlumberger, a world-wide oil well logging and service business.

In 1989 he became vice president and general manager of FMC Corporation's armament systems division, a position he still holds. He has managed to revitalize a poorly performing, unprofitable defense supplier despite recent declines in the defense industry.

Recognized by alma mater

The Minneapolis resident is on the board of directors of a number of corporations and has been a member of the College of Engineering advisory board since 1990. Recognizing his significant professional achievements and sterling professional ethics, the University awarded Ashton its Distinguished Alumni Award in 1989.

In 1991 Ashton was inducted into the Alumni Hall of Fame of Theta Tau national engineering society, an honor also bestowed recently on Ashton's late uncle, Edward L. Ashton (see "Iowa engineers grow a family tree," page 5).

Despite the widespread respect for his engineering management skills and ethical courage, Ashton says his actions during his career "were not too amazing." His parents' and professors' admonitions to do the right thing have served him well in facing two unusual situations that pitted his integrity against the likelihood of losing his job. Although the events swirling around the General Dynamics and Healthdyne scandals were stressful, Ashton says, the decisions about what he should do were always clear.

Students widen view for engineers of the future

When Adriana Platt was in high school, she took a battery of career counseling tests to help her decide what profession to pursue.

The results?

"I was told I'd be a good librarian or bricklayer," says Platt, a University of Iowa engineering student who has worked since her sophomore year for the likes of Square D and Rockwell International. Platt graduates this December with a degree in electrical and computer engineering.

"No one ever discouraged me from becoming an engineer—but no one mentioned it as a possibility, either."

Adriana Platt
Platt and other student members of The University of Iowa chapter of the Society of Women Engineers (SWE) are working hard to ensure that other talented young people understand that engineering is a possibility for each of them, regardless of their gender or ethnic background. Working through a series of grade school and high school outreach programs, SWE members hope to attract Iowa's best and brightest students to the engineering college.

Each year SWE members visit elementary school science classes and challenge the young students to build a bridge.

"We give each team 100 plastic straws and a roll of tape," Platt says, "and tell them to build the strongest bridge they can in 18 minutes. Then we test the results with weights.

"The whole experience is positive—we encourage even the 'losers' by pointing out the good things about their designs."

Platt, who was SWE president during the 1993-94 academic year, says that the elementary students often send follow-up letters asking questions about bridges and engineering.

That clearly pleases the Ames native, whose own interest in engineering was sparked by a youthful fascination with bridges.

Last year John Deere & Company sponsored visits by SWE members to several Dubuque elementary schools. SWE then hosted follow-up visits to the College of Engineering by 120 fifth graders from northeast Iowa city.

"We showed them basically the same things we show the high school students when they visit," Platt says. "It was the engineering college grand tour, with visits to the Iowa Driving Simulator, the electrical lab, the robotics lab, and a simulated mini-wind tunnel.

Platt says that by the time the children completed the tour, "they were pumped!" And that was before the egg drop contest even began.

Before arriving in Iowa City, each of 45 teams of Dubuque children had designed a container to protect a raw egg. Specifications restricted the dimensions to eight cubic inches and the materials to biodegradable substances.

"That meant no tape," Platt says. "We carried the kids' designs, with eggs inside, to the second-story fire escape on the south side of the Engineering Building and dropped them to the ground. We measured the success of each design by the weight of materials and the time required to 'package' the egg, and of course, whether the egg broke."

Peanut butter, marshmallows, and orange peels were just some of the packaging materials used.

"One group even cradled their egg in Jello," Platt says. "It was a great idea, but we had a little trouble convincing the kids not to eat the Jello when the experiment was finished."

Platt stresses that the SWE's 40 female members have served as excellent role models for bright high school girls weighing career possibilities. She adds that SWE is particularly interested in encouraging young women to apply to the college.

"We try to teach young people what engineering is and to encourage those who are good in science and math to consider engineering as a profession," she says. "Even the best high schools sometimes fail to convey this message. I went to a good high school with many resources, but no one ever actually said to me, 'You should go into engineering.'"

Platt stresses that the breadth of questions asked by the elementary students—especially the fifth graders from northeast Iowa city—clearly pleases the SWE members so they can reach a high school girl weighing career possibilities. She adds that SWE is particularly interested in encouraging young women to apply to the college.

"The outreach programs are great for them and for us," she says. "It's a lot of work, but we have a lot of fun, and it's nice when the visiting students are so enthusiastic. They'll say things like, 'You guys are cool—you're engineers.'"

"We just let them know that all it takes is a goal and gumption."
Collaboration pays off

IOWA TOOL SOFTENS THE JOLTS

Research makes good cars better

When the gleaming Mercury Sable eased off the Ford Motor Company assembly line last June, cheering spectators knew they were witnessing a novel event. Corporate engineers and academic engineers often view the world from different perspectives, yet Ford's pride and joy rolled off the production line displaying a bold gold and black University of Iowa banner.

And all the engineers had reason to cheer.

The prototype Sable is the first American vehicle designed with a special simulation-based software "tool" developed by University of Iowa College of Engineering faculty and staff. The software system, called CONTESA (Continuum Element Sensitivity Analysis), was created by the Iowa engineers specifically to help Ford tackle noise, vibration, and harshness problems that may occur in reduced-weight fuel-efficient cars.

"Competition in the industry has resulted in such excellent engine performance that manufacturers are now looking for other ways to increase fuel efficiency while maintaining ride safety and comfort," says K.K. Choi, professor of mechanical engineering and deputy director of the Center for Computer-Aided Design (CCAD). "Lighter construction means less fuel use. Unfortunately, lighter cars also tend to generate more noise and vibration."

Choi worked with CCAD research scientist Semyung Wang, who received his Ph.D. in mechanical engineering from Iowa in 1991, and six mechanical engineering graduate students to develop the software that predicts the effect of design changes on noise level, vibration, and fuel efficiency prior to construction. This new approach, called design sensitivity analysis, can quantify the effects of changes in thousands of design variables.

For instance, one significant question addressed by CONTESA was how altering the distribution of different metal thicknesses throughout the car would affect noise and vibration.

"Ford has tested the software we developed using a half a million degrees-of-freedom," Choi says. "By comparison, the typical examples published in the academic literature involve less than 1,000 degrees-of-freedom."

"In addition, using our software system and an engineering workstation, you can obtain sensitivity of noise with respect to 50,000 design variables in 42 seconds," he says. "If you had to obtain the same design sensitivity information by carrying out analysis for each design change, it would take more than 1,000 hours of Cray supercomputer time."

In 1989 Hari Kulkarni, Ford's senior research engineer, asked Choi whether he would be interested in working with the company to develop a design sensitivity analysis method for noise, vibration, and harshness. Choi responded enthusiastically and spent three months in Dearborn, Mich., brainstorming with Ford design engineers.

"Fostering cooperative research between industry and universities is the driving principle of the Center for Computer-Aided Design as well as the goal of the National Science Foundation," Choi says. "This project has been a perfect example of how successful such cooperation can be."

When Choi began his research with Ford, simulation engineers at the company didn't enter the design loop until after conventional design engineers had designed and built a product.

"In those days Ford simulation engineers would be asked to verify the performance, efficiency, and safety features of an already-built car," says Choi. "But the engineers wanted to be
involved in the front line of the design.”

It takes a long time—as much as five years—to design, build, and test a car using conventional engineering methods. Building prototype cars is costly and time consuming, and if tests show design alterations are necessary, engineers often must literally go back to the drawing board to redesign, rebuild, and retest the new product.

Computer simulation in the early design stages, however, will significantly reduce the time and expense required to take a new line of cars from the idea stage to actual production. The results of “tinkering” with variables can be determined almost immediately and with minimal cost—benefits that could easily reach beyond the automobile industry to the aircraft and ship-building industries.

“Some Ford engineers and executives were skeptical at first,” Choi says, “but they subject our methods to rigorous testing and finally accepted the accuracy of our results.”

Convinced that designing a car using simulation software would improve not only automobile design but also production efficiency, Ford engineers began to apply the software system to the current Sable production model. The result is a design that eliminates 12 pounds of automobile body weight without an increase in noise level.

“Twelve pounds would translate into savings of $18 million per year in materials for a line of cars,” Choi says. “And that savings is a direct result of Ford’s investment of half-a-million dollars in our five-year research project.”

In addition, development time for this aspect of design could be reduced from six months to a week, Choi says, an acceleration that could prove to be a tremendous advantage for company competitiveness.

To prove the effectiveness of the methodology developed at the University, Ford has built six Sables using controlled manufacturing techniques. Each car was built under identical manufacturing conditions and processes. Subassemblies manufactured in Ford plants around the country were assembled in Atlanta. Three of the six cars were standard Mercury Sables; the others were designed and built according to the method and software developed by The University of Iowa team.

All six cars have been shipped to Ford’s automobile proving ground in Dearborn to be tested. Microphones and vibration meters will gather data as successive drivers operate the cars continuously for 24 hours with the windows rolled up and without competing interior noise, such as radio music or air conditioning.

“There were several critical turning points in this project,” Choi says. “First, it is extremely unusual, perhaps unique, for a company to make hardware based on research conducted at a university. Typically, if a company provides funding for university research, it doesn’t also get involved in that research. But Ford committed considerable time and effort to this initiative.”

Second, Choi says, Ford was impressed by the fact that he and other CCAD staff members spent three months learning about the company’s manufacturing process. The automaker also was impressed by the full-time presence of CCAD professional engineer Semyung Wang, who provided direction and continuity throughout all stages of the project.

“By working together with industry,” Choi says, “academic engineers can achieve tremendous progress on challenging research questions. Not only do faculty members obtain funding for their research, but their students gain insight into basic theory development as well as experience working on important industry problems.

“And making a significant impact in the real world is the ultimate goal of engineering.”

K.K. Choi

NADS contracts

Development of the $32 million National Advanced Driving Simulator (NADS) was catapulted forward in February, when the federal government awarded design-competition contracts to two private firms.

The two $1.25 million, 13-month contracts will support design work of TRW Inc. of San Diego, Calif., and Contraves Inc. of Tampa, Fla. The firms will create motion and audiovisual software and hardware designs for driving simulation research. The winner of the design competition will be awarded a multimillion-dollar contract to build the NADS simulator at the University’s Oakdale Research Park. NADS is scheduled to be completed by 1998.

How’s my driving?

The University of Iowa Center for Computer-Aided Design (CCAD) has received a $299,994 award from the Federal Highway Administration to test driver response to raised markers of various colors, reflectivity ratios, and other variables under various road and environmental conditions.

The 13-month study will use the Iowa Driving Simulator, currently the most advanced system of its kind in the world. Ginger Watson Papelis, associate research scientist, and Jim Stoner, director of CCAD’s Iowa Driving Simulator and highway design program, will conduct the study with help from the Texas Transportation Institute at Texas A&M University.
Are we there yet? New guide means quicker, safer trip

Vintage maps have long been valuable collectibles, but Tom Dingus' research at the Center for Computer Aided Design just might make highway maps so rare as to be priceless.

Dingus, associate professor of industrial engineering and CCAD research scientist, conducts driver-in-the-loop simulations and actual road tests to determine the effects of vehicle design features and human behavior on driver safety. In a recent study Dingus analyzed TravTek, a computerized system that shows drivers the fastest route to a destination under current conditions.

The in-vehicle system, or IVS, is available through a menu screen mounted on automobile dashboards. Dingus' research, conducted on the roads of Orlando, Fla., was one of a dozen major studies funded by the Federal Highway Administration to evaluate the navigation system and compare it to that more conventional routing technique, the road map.

"We conducted a micro-analysis of the driving behavior of 42 people who were unfamiliar with the route we chose," Dingus says. "Using four miniature black-and-white cameras mounted in the car and measurement instruments such as accelerometers and steering and breaking instrumentation, we recorded the drivers' behavior as they tried to find their way to a destination."

The study noted where drivers looked as they drove, how often and in what way they used maps or the IVS, and how frequently they got lost. "Close calls" resulting from distraction by the directional aids also were recorded.

Dingus found that about 75 percent of the drivers were served as well or better by the high-tech TravTek as by paper maps. In general, the computerized system outranked conventional maps in efficiency, safety, and effectiveness.

"Not only did drivers use less planning time before beginning their journeys," Dingus says, "but once behind the wheel, they also made highway maps so rare as to be priceless.

It's virtual reality behind the wheel

In Jon Kuhl's worldview, illustrating reality is a far cry from recreating reality. Kuhl, professor of electrical and computer engineering and director of the vehicle design division at Iowa's Center for Computer-Aided Design (CCAD), helps guide a staff of 20 professionals and 50 students who create the hardware and software that convincingly simulates thousands of different driving environments and vehicle behaviors.

The team is uniquely capable of producing virtual reality and virtual prototyping with the Iowa Driving Simulator (IDS).

"IDS can represent extremely complex environments," Kuhl says. "It's one of only two driving simulators in the world that can produce full-motion cues as well as visuals and sound for the simulator 'driver.'"

"In addition, while other simulators can recreate only a few vehicles on roadways, we can simulate dozens. We are unique in our ability to produce almost 200 degrees of forward field-of-view visual display. That means the driver can see images out the side as well as the front of the simulation vehicle."

Six data base modelers have developed the extremely specialized and sophisticated IDS tools that provide peripheral and rearview mirror images.

Fine-tuned textured graphics impart a realistic quality far richer in depth and detail than the cartoonish images created by most other simulators.

"So much detail is required to produce this virtual reality that it can overload the capacity of the computer system," says Kuhl, who joined the Iowa engineering faculty shortly after receiving his Ph.D. in computer science from the University in 1980. "The real challenge for our database developers, then, is how to make rich, realistic detail without choking the image generator."

Researchers from around the world are using the IDS laboratory for many purposes, including experiments in virtual prototyping—designing new vehicle concepts and testing their effects on human operators without ever building an actual physical prototype. Virtual prototyping is far more economical than building and testing physical prototypes, and it allows for rapid and inexpensive design changes.

"With conventional engineering, you might get two or three shots at changing the design," Kuhl says. "We are developing techniques to allow designers to rapidly execute hundreds of design iterations to find the optimal one."
got to their destination more quickly."

That trip required about 20 minutes driving time for someone familiar with the route. On average, drivers who were unfamiliar with the route and navigated with maps needed 11 extra minutes just to plot their routes and about three additional minutes of driving time. Drivers using the IVS, however, required no additional planning time and only six additional minutes to drive the route.

"When people navigate with maps, they generally waste about 12 percent of their trip just trying to figure out how to get there," Dingus says.

Using computers to plan and navigate routes is only one of the possible applications of the new in-vehicle technology, Dingus says. Variations on the theme eventually will include collision-warning devices and computers that alert drivers to the condition and configuration of the road as well as signs ahead.

At a recent convention, Dingus counted some 60 vendors marketing variations on the in-vehicle intelligence systems.

"This area of engineering and safety is moving very quickly," Dingus says. "There will be a navigational database for every road in the country by next year, and consumers will be able to buy an in-vehicle navigational system in the '95 Oldsmobiles."

Dingus also is very involved in research on the Intelligent Vehicle Highway System, which not only will provide data about road conditions and obstacles to drivers but also may control the very act of maneuvering on-road vehicles.

"The new technology has the potential to be of tremendous benefit to drivers," Dingus says, "particularly in terms of safety."

Dingus, who earned a Ph.D. from Virginia Polytechnic Institute and State University in 1987, says he is a researcher "who uses simulators to evaluate the effect of human factors on driver safety."

"To that end, he explores the interface between human abilities and behavior, and machine performance."

"For instance, the sense of depth perception, which is critical to safe driving, may be altered in older drivers who undergo lens transplants for correction of cataracts. The effect of such transplants on depth perception and peripheral vision is being questioned increasingly."

Using a new fixed-base simulator with a narrower field of view but higher image resolution than that available through the Iowa Driving Simulator, Dingus is exploring how multifocal lens implants affect drivers' sight. The study is funded by a $400,000 grant from Allergan Medical Optics. "Multifocal implants allow people to focus at several distances," Dingus says, "but they transmit less light than the older monofocal lenses. Using about 100 subjects who will drive in the simulator, we will compare the safety performance of drivers who have multifocal lenses with those who have the new kind of lens."

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The performance of the brain also affects highway safety. Dingus, along with Matthew Rizzo, associate professor of neurology, and Daniel McGee, senior research assistant at CCAD, are investigating the driving abilities of persons with Alzheimer's disease.

"There are questions about whether people with Alzheimer's should be allowed drive," Dingus says. "We are trying to assess these people's ability to react and respond to traffic. We should be able to generalize our findings to anyone with Alzheimer's and, potentially, to anyone who has suffered a head injury."

Another advantage of the Iowa Driving Simulator is its unique ability to test the capabilities of operators with respect to a variety of vehicle designs.

"Today, designing and engineering is a long, sequential process that might demand six years from initial concept to final marketing of a machine," Kuhl says. "The first time a human being actually takes control of the machine is well downstream in that process—maybe four years. By then, many of the physical designs and manufacturing processes may be locked in.

"We can use computer prototyping much earlier to optimize reliability and performance well in advance of building hardware."

Manufacturers of passenger and commercial vehicles, trucks, boats, heavy road equipment, and agricultural equipment increasingly are recognizing the benefits provided by IDS's capacity for virtual prototyping.

"The role of the CCAD team that Kuhl directs is to provide the technology—or as he says, "the software and hardware underpinnings"—that enables other researchers to conduct virtual prototype experiments."

"Because I am not a mechanical engineer," Kuhl says, "my expertise is not vehicle design. Rather, my role is to help create the tools that will enable the mechanical engineers to design vehicles."

"The tools Kuhl and his staff create for IDS make it the world's most sophisticated computer-operated vehicle design simulator. "The more similar our simulated environment is to a real vehicle proving ground," Kuhl says, "the more real our data are. But most simulators' manifestations of virtual reality aren't very real. They're more along the gloves-and-goggles line and focus more on virtual than on reality."

"Simulating environments and vehicle conditions requires a huge amount of creativity and effort," Kuhl says. "Recreating reality in a computer is half art, half science."

Some software developed at Iowa is being used in other simulators and will be applied at the $32 million National Advanced Driving Simulator (NADS) when that facility is completed at the University's Oakdale Research Park in 1998.

Although the IDS staff will provide software upgrades to keep NADS current, Kuhl says, most IDS software is specialized for the one-of-a-kind facility, which will continue to have its own unique, broad mission for years to come.
New leader for Hydraulics Institute

Virendra C. Patel, University of Iowa Foundation Distinguished Professor of Mechanical Engineering, became director of the Iowa Institute of Hydraulic Research (IIHR) on June 1. He succeeds Robert Ettema, professor of civil and environmental engineering, who served as acting director of the institute following the death of longtime institute director John F. Kennedy in December 1991.

During his 23 years at Iowa, Patel has published two books and more than 150 technical articles. He is an expert in boundary layer theory, turbulent shear flows, wind engineering, ship hydrodynamics, and computational fluid dynamics and hydraulics. He recently was recognized with a Regents Award for Faculty Excellence, one of only 22 faculty members in Iowa’s five regents institutions to receive the honor.

Noting the numerous honors and awards Patel has received during his distinguished career, Dean Richard K. Miller said, “The institute is fortunate to have as its new director an individual with an outstanding international reputation in research and an Iowa faculty member with rare distinction in both teaching and University service.”

“For me this is an exciting time,” Patel said. “The Iowa Institute of Hydraulic Research, with its established reputation and international connections, can provide leadership in developing new areas of research that require a multidisciplinary approach and integration of emerging technologies.”

New profs join college in 1993-94

The college recently welcomed two new faculty members in civil and environmental engineering. Allen Bradley joined the faculty in December and Annmarie Eldering came to Iowa in April. Both are assistant professors.

Bradley, who teaches hydroclimatology, hydrometeorology, and principles of hydrology, earned his B.S. magna cum laude from Virginia Polytechnic Institute, his M.S. from Stanford, and his Ph.D. from the University of Wisconsin-Madison. He is an expert on hydroclimatological and climatological aspects of extreme flood-producing rainstorms and has analyzed flood data from areas as diverse as the southern Great Plains and coastal California.

Bradley was raised in northern Virginia, where his interest in engineering was sparked by an uncle who is an engineer and by his summer experience as a land surveyor. His extensive professional experience includes developing new methods for estimating flood frequencies in urban areas using simulated streamflow data and determining flooding risk for an 800-acre landfill site.

He is a member of the American Geophysical Union, the American Meteorological Society, and the American Society of Civil Engineers.

Allen Bradley

Bradley is delighted with his experiences at Iowa, citing the high quality of engineering graduate students and impressive resources of the Institute of Hydraulic Research as one of the high points of his new position.

Bradley relaxes by scuba diving, golfing, and brewing homemade beer.

Eldering earned her B.E. in chemical engineering with summa cum laude from Cooper Union for the Advancement of Science and Art in New York City.

“Most of my classmates went into the chemical industry after graduation,” Eldering says. “But I wasn’t ready to stop studying, and my interest in air pollution had been sparked by a graduate level course I had taken at Cooper Union.”

The Stuyvesant, N.Y., native decided to pursue environmental engineering and earned her M.S. and Ph.D. degrees in environmental engineering science from the California Institute of Technology in 1989 and 1994, respectively. Her dissertation research focused on alternative models for air pollutant effects on visibility.

As a graduate research assistant, Eldering developed an improved image processing-based visibility model that produces syn-
Three win '94 collegiate awards as stand-out faculty members

Three College of Engineering faculty members were presented with collegiate awards at the college's faculty awards luncheon, held April 25 in the Iowa Memorial Union.

Mark Andersland, assistant professor of electrical and computer engineering, was recognized as one of 13 teachers University-wide to receive a University of Iowa Collegiate Teaching Award. Bestowed by the University's Council on Teaching, the award carries a $3,000 stipend. Andersland, who joined the Iowa faculty in 1989, also won the College of Engineering Faculty Teaching Award for 1994.

Andersland teaches courses on the design of electrical circuits, control systems, and communication systems.

Said one of Andersland's former students, "Professor Andersland was able to make abstract concepts involved in systems analysis surprisingly clear and simple. He also did an excellent job of applying these abstract concepts to real engineering systems. This is very important in preparing students for their careers."

Dean Richard K. Miller also praised Andersland for his dedication and gift for teaching.

Another honoree at the faculty awards luncheon was Forrest M. Holly, Jr., professor of civil and environmental engineering and research engineer at the Iowa Institute of Hydraulic Research. Holly was awarded the College of Engineering Faculty Service Award.

Holly, who joined the faculty in 1982, has devoted many hundreds of hours to University service. He led the recent search for the new College of Engineering dean. He also has led the college's teaching committees and was instrumental in engineering's effort to compose a framework for instructional improvement, which helped establish the college as a leader in undergraduate education.

Holly is an expert on alluvial and stream-bed hydraulics and computational methods and has published extensively.

In honoring him, Dean Miller said, "Forrest Holly has earned the unqualified respect of his colleagues for his honesty, judgment, genuine concern, and deep commitment to the welfare of the college. He also has established a firm reputation among the students as a superb teacher who is firmly dedicated to their success both inside and outside the classroom."

Karl F. Lonngren, professor of electrical and computer engineering, received the College of Engineering Faculty Research Award. Lonngren's research at the college has spanned some 30 years, including extended periods of work in laboratories around the world.

Lonngren, who holds a dual appointment as professor of physics and astronomy, teaches applied physics and is an expert in experimental and theoretical nonlinear wave-plasma interaction studies.

"Karl Lonngren is an inspiration to all who know him," Miller said. "His work is contained in about 200 journal papers, is widely referenced by his peers, and has earned him recognition by election to Fellow grade in the IEEE. His textbook on physical electronics is widely regarded as one of the fundamental works in the field."

Both Lonngren and Holly received $1,000 stipends from the college gifts fund.

Winners of the College of Engineering 1994 faculty awards (left to right): Mark Andersland, Karl F. Lonngren, and Forrest M. Holly, Jr.
Joe Ehle says that deciding to participate in a cooperative education experience was rather simple. "I hadn’t really thought much about it until May of my sophomore year," says Ehle, a junior in chemical and biochemical engineering. "Then I saw how many seniors were looking for jobs and how many companies were looking for people with experience. That situation made the decision for me."

In January Ehle began full-time work as one of five co-op employees at Quantum Chemical Company in Clinton, Iowa. He will spend a total of two semesters and one summer in the program, which is designed to provide a professional, real-world setting in which students can apply their academic training.

"Working here is entirely different from school," Ehle says. "In school, students are often presented with one problem and everyone works toward a single solution. Here, problems are rarely so well-defined. We might spend 80 percent of our time just setting up the problem."

Ehle adds that because an engineering problem might have three or four possible causes, teams of engineers often must explore multiple solutions. Team members’ motives and goals differ and may even conflict as the group argues the advantages of various solutions.

"One of the benefits of the co-op setting," Ehle says, "is the opportunity to develop maturity and professionalism to deal with everyday uncertainties in the real world of the professional engineer."

Andy Ruppenkamp, a Quantum Chemical environmental engineer who works with co-op students, adds, "Students can develop excellent communications skills through their co-op experience. You might be a top engineering student capable of creating the best design solution in the world, but if you can’t explain that design and convince others of its efficacy, then you won’t get very far with your ideas."

Ruppenkamp, who grew up in Iowa City and graduated from the University in 1993, knows first-hand how beneficial the program can be. While earning his B.S. in chemical engineering he participated in the program, working in Quantum’s production and environmental units.

Ruppenkamp adds that his professors often mentioned they could spot co-op students by the sophistication of their research questions and the excellence of their papers. Ruppenkamp and Ehle stress that the co-op experience also allows students to become familiar with industry settings in general, as well as the specific organizational and operational details of the particular company at which they work.

"Co-op really gave me an advantage when it came time to look for work," Ruppenkamp says. "If you’ve never worked in industry, those first few weeks can come as quite a shock. But the co-op pro-
gram can ease the transition by providing mentors and a more gradual adjustment to the industry's work environment."

Although Ruppenkamp is not directly responsible for any co-op students, he does work with and mentor one engineering student in the program.

"If she comes to me with questions, I try to make a special effort to talk things through," he says. "Because I worked as a co-op myself, I can anticipate some of her questions and provide critical information and job details up-front."

He notes that compensation for co-op students generally is excellent, with many being paid as much as 75 percent of the starting salary of a beginning engineer with a bachelor's degree. Quantum, like most other companies, is concerned that participating students live in quality housing that is economical and offers reasonable security. Ehle says he enjoys living in the same Camanche, Iowa, building as his fellow co-op students, all of whom received reduced rent charges.

"All five of us work in different areas of the plant," he says, "but we still compare notes and try to help each other when a particularly tough problem arises. One nice change from school, however, is the fact that when it's time to relax, we don't always talk about engineering!"

Co-op arrangements clearly benefit not only the students but also the companies that participate.

"Quantum hires only those students it may hire later as full-time engineers," Ehle says. "Co-op provides the company with a chance to evaluate us for future employment."

"When a company hires an engineer who participated in co-op as a student, it gets a new employee who is already halfway trained and who can get to work a lot faster," says Ruppenkamp, who is one of five engineers working at the Quantum plant in Clinton who also were co-op employees with the company.

He adds that co-op students can provide companies with the opportunity to widen the scope of their research.

"If a company can save several million dollars per year by pursuing one line of research," Ruppenkamp says, "it may abandon another research area that has the potential to save only $40,000 annually. But that smaller project may be perfect for a co-op to explore and might even result in a financial savings for the company. Hiring co-ops frees up full-time professional engineers to work on the bigger, higher priority projects."

Joe Ehle says he has recommended the co-op program to a number of his friends, who then contacted Engineering Career Services to get help with arranging a job in industry. He adds that so far, the many benefits of his own co-op experience have far outweighed its single drawback: the nonexistent nightlife in Camanche, population 4,750.
Gary Seamans (B.S.E.E. '71), chief executive officer of Westell Company in Chicago, presented an inspiring address to spring College of Engineering graduates. At commencement ceremonies May 13, Seamans spoke about his experiences in the engineering and entrepreneurial worlds.

"Gary gave a terrific speech, in which he stressed the importance of flexibility and openness," says John Robinson, professor of electrical and computer engineering and associate dean. "He also underscored the need for cross-pollination of ideas between the worlds of industry and higher education."

Robinson adds that Seamans described his advanced communications technology company as "standing in the middle of the information superhighway."

Bachelor of Science in Engineering degrees were conferred upon 139 graduates during the ceremony, which was held at Hancher Auditorium. Earlier that day, the Graduate College conferred 33 graduate degrees in engineering: 25 Master of Science degrees and 8 Doctor of Philosophy degrees.

The College of Engineering renewed some of its international ties last fall when Dean Richard K. Miller visited Japan and Korea. Miller participated in the trip to Korea at the behest of University of Iowa president Hunter Rawlings, who recently renewed the University's commitment to strengthen its international relationships and maintain strong exchange ties with Tokyo Denki University.

Miller's first stop was Tokyo, where he spent several days talking with administrators, faculty, and students of Tokyo Denki, an engineering and technical school that trains 10,000 students on three campuses.

For a number of years Iowa has participated in an exchange program with the Japanese school. This summer, four Iowa engineering students studied at Tokyo Denki, learning about Japanese culture while training in engineering. In the past The University of Iowa has hosted as many as six faculty members and several groups of students from Tokyo Denki.

"This exchange program offers a unique opportunity for students and faculty from both countries," Miller says. "Some of our best students have taken advantage of it."

After leaving Japan, Miller visited South Korea, joining an Iowa statehouse delegation led by governor Terry E. Branstad. The group was on an economic development mission for Iowa, and Miller spent several days visiting Korean manufacturing operations.

"We toured several corporate headquarters per day," the dean says, "and at night our hosts treated us to large, formal Korean dinners."

During his visit Branstad underscored the many advantages for foreign countries of investing in Iowa, including the state's highly educated population, low crime rate, moderate cost of living, and favorable corporate tax climate. He pointed to success stories such as metals manufacturer PMX, located in Cedar Rapids and the largest Korean-owned manufacturer outside of Korea.

Miller touted Iowa, too. "I tried to emphasize the many resources our state can bring to the table," he says, "one of the most important of which is The University of Iowa."

Miller adds that professor and director of biomedical engineering Kwan Rim served as an effective spokesperson for the University and as liaison among representatives of the three countries.

"Kwan Rim's participation was essential to our success," Miller says. "His extensive contacts and experience in both countries enabled us to have highly productive meetings with the presidents of several companies interested in strengthening their ties with the United States in general and with Iowa in particular."

The Japanese and Korean corporate directors are interested in several areas of strength at the University, including the Center for Computer-Aided Design, the Iowa Driving Simulator, and the National Advanced Driving Simulator, due to be completed in 1998.

During his stay in Korea, Miller served as master of ceremonies at a University of Iowa alumni meeting, attended by the governor and some 50 alumni, two-thirds of whom had graduated from the College of Engineering.
Course offers a new way to network

There's nothing fuzzy about the aim of Santosh Ananthraman's course in electrical engineering: to address central questions and techniques in the field of artificial neural networks and their applicability to the solution of real-life engineering problems.

The course, Artificial Neural Networks and Their Applications, emphasizes the relationships between intelligent techniques—such as fuzzy logic and neural networks—and classical techniques for solution to prediction, classification, and control type problems. It is offered to upper-level students.

Ananthraman manages the advanced technology group at Neural Applications Corp., a young computer software company with headquarters at Oakdale Research Park. At its inception, the company sought to establish strong collaborative ties with The University of Iowa.

Ananthraman's course, offered once a year at no cost to the University, is part of that effort.

"Around the time I began work here," Ananthraman says, "Dean [Richard K.] Miller and Professor [Sudhakar M.] Reddy contacted the company about providing this type of instruction. This is the first time such a course has been offered."

With Ananthraman's guidance, class members explored theoretical concepts and architectures in the area of neural networks, including supervised, unsupervised, and reinforcement learning methods. The students then applied the theoretical information to projects that had practical implications.

"The field of intelligent systems has a whole range of industrial applications," Ananthraman says. "It's a 'hot' research area that has improved productivity in food and chemical, medical, and metals industries."

In addition to providing students with the opportunity to explore in depth a state-of-the-art area of engineering and computer science, the course also has been a springboard for several students to become cooperative education employees or to take summer internships, for which Neural Applications offers scholarships.

Ananthraman devotes considerable effort to honing the reading and speaking skills of his students, each of whom must study and present a paper from the literature on intelligent systems. The students are critiqued by their peers as well as by Ananthraman.

"It is good preparation for the future," Ananthraman says, "when they will have to make succinct presentations at conferences and handle questions from other experts."

The course received excellent reviews from class members.

"The layout of the course was excellent and very practical," said one. Added another, "The contents were very helpful to my personal research."

Impressive class

The students who entered the College of Engineering in fall 1993 were "clearly the most impressive class we've had in recent years," says Norlin Boyd, assistant to the dean for undergraduate students.

With an average ACT composite of 28, the class ranked in the 94th percentile nationally. The mean high-school academic grade-point average for first-year students entering in 1993 was 3.75—a mean high school class rank at the 90th percentile.

Boyd notes that students from Iowa had slightly higher academic credentials than did their out-of-state counterparts. Female students ranked slightly above males.

The class not only boasted sterling academic credentials, but also included the highest percentage of women in any engineering freshman class in the college's history.

"During the last decade the percentage of women in the college has grown steadily," Boyd says, "and almost one-third of this class was women. Retention of female students also seems to be improving."

The class was also the most diverse in college history.

"The great news about the College of Engineering's student minority population as a whole is that its average cumulative grade-point average is essentially the same as the college's overall G.P.A.," says Boyd, who with Victor Rodgers, faculty adviser and assistant professor of chemical and biochemical engineering, assists the Multi-Ethnic Engineering Student Association.

"This accomplishment is extremely significant," Boyd continues, "when compared to national data for undergraduate ethnic minority engineering students."

He adds that the college also can be proud of the high proportion of minority engineering students who completed their engineering degree program over the course of the August 1992 to May 1993 school year.
Stover winners

A team of four undergraduate mechanical engineering students has won first prize in the 27th annual Dave Stover Memorial Student Projects Competition, sponsored by the Society of Automotive Engineers Mississippi Valley Section. The award was presented in April at Deere & Company's Dubuque, Iowa, plant.

The team, including Chris Finck of Janesville, Iowa, Burk Kladde of Omaha, Neb., R. James Schraut of Crystal Lake, Ill., and Loren Stowe of Coeur d'Alene, Idaho, designed and built a semiautomatic transmission for an SAE Formula car. K. Harold Yae, assistant professor of mechanical engineering, supervised the project.

Bridge contest

Some 175 engineering students from eight colleges in the Midwest and Canada came to The University of Iowa late last winter for the 50th Annual American Society of Civil Engineers (ASCE) Midwest Regional Student Conference.

The students, accompanied by their advisers, took part in a bridge building contest. School teams incorporated varying lengths of steel into a 20-foot-long model bridge capable of supporting a 3,000-pound load. Entries were judged on aesthetics, strength, and elegance of design.

The conference, held last February in conjunction with National Engineers' Week, also included discussions, a job fair, and a banquet.

Transportation scholar named Student of Year

The Midwest Transportation Center, a consortium of scholars at The University of Iowa Public Policy Center and Iowa State University, named Iowa graduate student Jeffrey A. Barlow 1993-94 Outstanding Student of the Year. Barlow, a University Graduate Transportation Scholar who completed his master's degree in civil and environmental engineering in August, was one of ten students from across the country honored for their achievements and promise in research, academic performance, professionalism, and leadership.

U.S. Assistant Secretary of Transportation Morton Downy presented Barlow with his $1,000 award at an annual banquet January in Washington, D.C.

"The U.S. Department of Transportation takes these awards quite seriously," says David J. Forkenbrock, who directs The University of Iowa Public Policy Center and holds a dual appointment as professor of urban and regional planning (College of Liberal Arts) and civil and environmental engineering.

The Midwest Transportation Center was established under a DOT program to focus on long-term applied research spanning the wide-ranging issues and challenges in providing safe, efficient transportation. Each year, Forkenbrock says, the center chooses 14 graduate students in civil engineering, economics, geography, industrial engineering, psychology, and urban and regional planning as Graduate Transportation Scholars. The Outstanding Student is chosen from those 14 on the basis of a substantial research paper prepared during the year.

Barlow, who earned his B.A. in civil and environmental engineering at The University of Iowa in 1992, centered his research on the development of a model to predict pavement damage caused by subgrade pumping action. His work was part of a project funded by the Midwest Transportation Center to analyze pavement deterioration under dynamic loadings associated with heavy truck traffic.

New software opens Windows, wins competition

Jeffrey Bishop has been named one of five winners of a National Easter Seal Society design competition for development of assistive and rehabilitation technology. The biomedical engineering graduate student presented his design in June at a conference in Nashville, Tennessee.

Working with Glenn Myers, assistant professor of biomedical engineering, Bishop developed "Visual Keyboard," a software program that enables people with impaired mobility to perform most computer functions. The unique program allows users to work directly with Windows software such as Word, Lotus 1-2-3, or WordPerfect—standard software used in homes, schools, and businesses—and to interface with the Internet. Users interact with the keyboard through a pointing device such as a mouse, trackball, touch screen, or EyeMouse, or with a switch input device such as eye-blink or foot switches or sip/puff devices.

Visual Keyboard is being evaluated at 15 test sites on three continents. One of the test sites is the Information Arcade at The University of Iowa Libraries, where Bishop works as a graduate assistant.
Floods of 1993 spark UI symposium on global change and the Midwest

Many of the nation’s top experts on global change convened at the University last April for the “Symposium on Global Change II: A Midwest Perspective.” The event included discussion of the effects of the 1993 Midwest flood, trends in greenhouse gas, stratospheric ozone depletion, biodiversity and sustainable development, and how these issues affect the Midwest. The symposium was sponsored by the University’s Center for Global and Regional Environmental Research (CGRER), The International Society of Biometeorology, and the Iowa United Nations Association. It was chaired by Gregory Carmichael and Jerald Schnoor, co-directors of CGRER, and Edgar Folk, professor emeritus of physiology and biophysics. Although the gathering was sparked by the events of last year’s unprecedented midwestern flooding, it emphasized a global perspective, drawing on the knowledge of experts such as Andrew Steer of the World Bank, and Tim Wirth, formerly governor of Colorado and currently of the U.S. State Department, who attended the 1992 Earth Summit in Rio de Janeiro.

Professor’s challenge is more than just hot air

In a speech presented on Earth Day, April 22, before the 106th annual meeting of the Iowa Academy of Sciences, Professor Jerald Schnoor challenged Iowans to reduce the state’s net greenhouse gas emissions to zero. Iowa would be the first state in the nation to achieve this goal.

Schnoor urged Iowans to reduce the amount of gas emitted from cars, homes, and factories. Each of the state’s approximately 2.8 million people emits an average of 27 tons of carbon dioxide per year, Schnoor said, a statistic that ranks the state 13th in the nation per-capita. The area’s continental climate, long distance travel, and high-input agriculture contribute to the high rate.

Schnoor called on industry, utilities, and state and local governments to embark on energy savings programs, saying, “There are many ways to save energy that also will reduce greenhouse gas emissions.”

He also stressed reforestation of native trees and vegetation.

“There is a large-scale potential for tree plantings and prairie restoration,” he said, “which would trap carbon dioxide, an important greenhouse gas.”

High school researchers wrap up long-term projects

Sixty high school students from Iowa and surrounding states gathered in Iowa City last May to present the results of research they conducted as participants in the fourth annual University of Iowa Summer Institute for Creative Engineering and Inventiveness.

The presentations were the culmination of work begun the previous July during a three-week residential engineering program at the University. Panels of engineers evaluated the written projects and oral presentations and made ten commendations for each category. Students who received commendations also were awarded a College of Engineering scholarship of $500 to $2,000.

Sponsored by the College of Engineering, the National Science Foundation’s Young Scholar’s Program, and the Connie Be- lin National Center for Gifted Education, the summer institute is designed to provide high school students with the opportunity to work on an engineering project under the guidance of an engineering mentor.

Step aside, R2D2: Kids tour real world of robotics

Several Iowa City-area grade school students ventured into the realm of robotics last spring when Evelyn Frey, a College of Engineering senior, gave them an introduction to the college’s robotics lab. Frey (second right, leaning over the shoulder of one of her visitors) told the young students about some of the many ways robots are used in industry, who designs robots and who works with them, what problems robots can pose, and why industries might choose to use or not to use robots. Then Frey let the youngsters do a little hands-on exploration of the lab and it’s equipment. Frey says that one team of students, on its second tour of the lab, actually wrote a computer program to control one of the robots. The tours were part of an Iowa City Science Foundation program that uses area resources to introduce children to sciences such as computing, engineering, geology, and mathematics.
The Sixth International Conference on Numerical Ship Hydrodynamics, held in Iowa City last year, honored one of the College of Engineering’s most revered teachers: Louis Landweber, professor emeritus of mechanical engineering. Sponsored in part by the Iowa Institute of Hydraulic Research (IIHR), the conference was organized by V.C. Patel, UI Foundation Distinguished Professor of Mechanical Engineering, and Fred Stern, associate professor of mechanical engineering.

"Numerical ship hydrodynamics is developing at least as fast as the parent field of computational fluid dynamics," says Patel, who recently was named the director of IIHR. "The field is pioneering a number of new approaches."

The international conference is held every four years to promote development of efficient computerized ship design methods. More than 100 participants from the United States and 16 other countries presented 42 professional papers at last year’s conference.

"I even gave a paper at my own conference," Landweber says, smiling.

Landweber, elected to the National Academy of Engineering in 1980, has long been recognized as one of the world’s leading ship hydrodynamicists. After 40 years at The University of Iowa, and despite his "retirement" in 1982, he continues to work every day in his fourth-floor office at the IIHR.

Landweber and one of his former students, Ali Shahshahan, recently submitted a grant proposal for a project attempting a mathematical resolution of a famous paradox in fluid dynamics.

"Current mathematical formulas predict that if we ignore the viscosity of a fluid, two blunt objects approaching each other in a liquid could never meet," Landweber says. "I have an idea how to resolve the paradox."

Landweber and Shahshahan published an article describing their investigation of this conundrum in the June 1992 issue of The Journal of Ship Research. Their research is supported by the U.S. Office of Naval Research and Mobil Oil Corporation.

Landweber graduated in 1932 from City College of New York with degrees in mathematics and physics, then entered a disastrous job market.

"I was looking for work in the midst of the Depression," he says. "The federal government was the only source of employment, so I took the Junior Physicist Civil Service Exam."

Landweber was appointed a junior physicist at the United States Experimental Model Basin, located at the Washington Navy Yard. "The laboratory built and tested models of ships," he says. "Although my first assignment was boring, I ended up staying in the field for the rest of my life."

The job—passing smooth curves through a mass of experimental data for a family of about 100 propellers—may have been boring, but it was not without peril. When Landweber invented a machine that could draw efficiency curves related to thrust and torque curves much more quickly than the standard method of wrestling with 300 curves, his first supervisor almost fired him.

"He said that in the time it took me to build that machine," Landweber says, "I could have finished the job. But that wasn’t true. Eventually we became good friends."

A library in one corner of the huge room where Landweber worked lured him to read more about fluid mechanics and hydrodynamics. Realizing that ship design entailed knowledge of sophisticated mathematics, he decided to return to school.

"In those days, George Washington University catered to full-time federal employees," Landweber says, "so I worked during the day and earned my M.A. in physics at night."

Landweber continued to pursue his interest in classical physics at the University of Maryland, where he earned his Ph.D. in 1951. By 1954 he had become head of the hydrodynamics division at the David Taylor Model Basin in Washington. That year he came to The University of Iowa as professor of mechanics and hydraulics and research engineer at the Iowa Institute of Hydraulic Research.

During last summer's hydrodynamics confer-
and imagination on Landweber's part to conceive of this project and to recognize that it was feasible and ultimately achievable.”

Landweber's contributions are recognized not only by hundreds of former students from around the world—including more than 50 M.S. and Ph.D. students he supervised—but also by colleagues who have benefited from his expertise and experience. Fred Stern, who joined the faculty to teach hydrodynamics shortly after Landweber retired, says that hydrodynamics as a field of study and research owes its very existence at Iowa to Landweber.

“He established the foundations of a program that has grown to achieve an international reputation,” Stern says. “And he is a giant personally as well as academically.”

Stern says that anyone who ever came to Landweber with a problem probably recalls the same scenario: The soft-spoken professor offers the visitor a chair alongside his own desk, pulls out a writing shelf, positions his pencil and writing pad, and then gently talks the visitor through the problem step-by-step.

Although Landweber says he “never took an engineering course in my life,” he has been honored with membership in the prestigious National Academy of Engineering.

Landweber and his wife, Mae, have two sons and four grandchildren. Their oldest son attended the conference. He and one of the Landwebers' grandsons are mathematicians.
Tau Beta Pi session on technology spotlights manned space flight

The Paul D. Scholz Symposium on Technology and Its Role in Society was held last March at the Iowa Memorial Union. The symposium provided a forum for speakers to debate the issues involved in manned space flight and its future.

Speakers included James A. Van Allen, University of Iowa professor emeritus of physics, Jeff Bantle, U.S. space shuttle flight director from the Johnson Space Center, Ralph DeGenaro, a space policy analyst for Friends of the Earth, and Robert W. Phillips, chief scientist at NASA Jet Propulsion Laboratories.

“The symposium provided a forum for diverse opinions reflecting a wide range of priorities,” says John P. Robinson, College of Engineering associate dean for academic programs. “The speakers and the audience wrestled with hard questions: Should we support manned space flight, what are the alternatives, and what are the political and social implications of our decisions.”

About 350 people attended the talks and discussions, which were moderated by P. Barry Butler, University of Iowa associate professor of mechanical engineering and coordinator of the Iowa Space Grant Consortium.

For almost two decades, the symposium—recently named in honor of the late Paul D. Scholz, associate dean of engineering—has provided a forum for discussion of issues touching on engineering and its impact in society.

Hinton sets fund in daughter’s memory

Cecil Hinton, a University of Iowa engineering graduate from Coggon, Iowa, has established a scholarship through the University of Iowa Foundation in memory of his daughter, who died last year. Beginning in 1995, the Cathy S. Hinton Scholarship Fund will provide a $1,000 award for a woman engineering student who is an Iowa resident.

Cathy Hinton died in an automobile accident south of Troy Mills, Iowa, July 10, 1993. Cathy, then 39, was driving to a company picnic at J&S Engineering in rural Shellsburg, where she worked as a drafting artist.

Cecil Hinton received his bachelor’s degree in mechanical engineering from Iowa in 1948 and worked for General Electric in New York and Collins Radio (later Rockwell International).

For more information about the Cathy S. Hinton Scholarship Fund, contact the University of Iowa Foundation, P.O. Box 4550, Iowa City, IA 52244-4550.

Junior wins Scholz Scholarship

Ryan Morrissey, a junior in mechanical engineering from Ottumwa, Iowa, has received the Paul D. Scholz Memorial Scholarship. Morrissey was honored in April as the engineering undergraduate who best exemplifies the academic and personal qualities for which Scholz was known: integrity, leadership, and dedication to excellence.

The $1,500 scholarship was established in 1993 to recognize and support a student who expects to enroll in a graduate degree program in engineering and possibly become a faculty member in an engineering school. Morrissey plans to pursue a career as an engineering professor or researcher in a national laboratory after completing his graduate studies.

Paul D. Scholz served the college and the University in a variety of positions during his 25-year tenure at Iowa, including associate dean, interim dean, acting chair of the department of biomedical engineering, and member of numerous institutional committees. His spent 20 years as faculty adviser to the local chapter of Tau Beta Pi, 12 years as adviser to the college's Associated Students of Engineering, and 3 years as co-director of the Summer Institute for Creative Engineering and Inventiveness.
1993 HONOR CLUB CONTRIBUTORS

This honor roll gratefully acknowledges University of Iowa College of Engineering alumni whose generous 1993 contributions qualified them for membership in the UI College of Engineering honor clubs, which recognize high-level annual contributions to the Engineering Development Fund and other college-wide funds. The listing shows UI engineering graduates who qualified for membership in the Dean's Club (annual contributions of $1,000 or more), the Transit Club (contributions of $500-$999), or the MECCA Club (contributions of $250-$499) during the 1993 calendar year.

Other contributors, including spouses of alumni and corporate contributors, will be recognized in the college's annual Honor roll of contributors (published each fall) and in the University of Iowa Foundation's Annual Report on Giving.

**Dean's Club**

Adams, Leland C. ('48), Lake Forest, Ill.
Aden, Victoria A. ('81), Houston, Tex.
Annett, Margaret E. ('80), Chicago, Ill.
Arner, Donald W. ('43), Kalamazoo, Mich.
Brown, Delno W. ('43), Moline, Ill.
Calhoun, John C. ('64), West Des Moines, Iowa
Chaney, Robert M. ('48), East Moline, Ill.
Cole, John V. ('43), Santa Ana, Calif.
Cupple, Francis T. ('68), Miami, Fla.
Corcoran, John J. ('68), Portola Valley, Calif.
Crow, Richard H. ('47), Irvine, Calif.
Dunnmore, Ronald W. ('61), Cedar Rapids, Iowa
Emmett, Richard E. ('51), Avalon, N.J.
Fetkhe, Wayne G. ('71), Middleton, Wis.
Foderberg, Dennis L. ('65), Shoreview, Minn.
Glazer, Edward ('41), San Diego, Calif.
Guthrie, Hugh D. ('43), Morgantown, W. Va.
Henry, Allen S. ('68), Melbourne Beach, Fla.
Hinton, Cecil W. ('48), Coggon, Iowa
Hotes, Frederick L. ('41), Chico, Calif.
Jipp, Raymond H. ('43), Jacksonville, Fla.
Kaplan, Samuel X. ('47), Beverly Hills, Calif.
Kehn, Donald M. ('44), Houston, Tex.
Larson, Harold A. ('48), Simpsonville, S.C.
Latimer, Ray ('42), Naples, Fla.
Lightner, James R. ('44), Dallas, Tex.
Lowenberg, Thomas J. ('62), Pine Springs, Minn.
McIntosh, James R. ('62), Metairie, La.
Meyer, Randall ('48), Houston, Tex.
Mulhaup, Bruce H. ('43), Tucson, Ariz.
Neely, Robert H. ('82), Grayslake, Ill.
Olinger, Bruce A. ('71), Nashville, Tenn.
Pagel, Warren C. ('53), Hudson, Wis.
Phipps, Harold R., Estate ('25), Iowa City, Iowa
Poma, Stephen R. ('78), Chicago, Ill.
Priester, Henry Wyatt ('84), Springfield, Ill.
Sangster, William M. ('47), Atlanta, Ga.
Seaman, Gary F. ('71), St. Charles, Ill.
Slattery, Timothy P. ('81), Des Plaines, Ill.
Smith, Clifford V., Jr. ('54), Newtown, Conn.
Smith, Robert L. ('47), Lawrence, Kans.
Strand, Carl P. ('47), Ashland, Oreg.
Sommers, Joseph B. ('48), Hanford, Calif.
Sword, Paul E. ('52), San Antonio, Tex.
Temple, Philip A. ('50), Irving, Tex.
Tinker, Sharon K. ('80), Houston, Tex.
Tweed, Donald G. ('55), Mountain View, Calif.
Wright, Stephen E. ('47), Doylestown, Pa.

**Transit Club**

Bellingham, Thomas O. ('79), Rochester, Minn.
Bresaw, Thomas F. ('77), Silverdale, Wash.
Chrencik, Frank ('37), Birmingham, Ala.
Coffeen, Hale L. ('43), Tucson, Ariz.
Craig, Anne E. ('89), Glendale Heights, Ill.
Fisher, Hugh A. ('64), Naperville, Ill.
Flyn, Helen E. ('76), Cedar Rapids, Iowa
Gibson, James F. ('49), Richardson, Tex.
Gingerich, Lando, Jr. ('59), Naperville, Ill.
Grissel, Elmer F., Jr. ('43), Cedar Rapids, Iowa
Hanson, Thomas R. ('60), Hinsdale, Ill.
Hemesath, Norbert B. ('59), Cedar Rapids, Iowa
Huang, Ted C. ('74), Sunnyvale, Calif.
Ihde, Wayne W. ('76), Boulder, Colo.
Lichtenberger, H. William ('59), Ridgefield, Conn.
Marling, Steven J. ('82), Columbia, Mo.
Murray, Thomas F. ('32), Bronxville, N.Y.
Nicodemus, Keith L. ('52), Wheaton, Ill.
Noe, John W. ('43), Midlothian, Va.
Pierson, Russell E. ('52), Lockport, Ill.
Reinga, Herr M. ('65), Cedar Rapids, Iowa
Shoemaker, Thomas M. ('43), Clearwater, Fla.
Singh, Pratap ('69), Round Rock, Tex.
Siemens, Charles O. ('33), Green Valley, Ariz.
Stapleton, Joseph F. ('82), Indianapolis, Ind.
Stevens, Stephen A. ('77), Wappingers Falls, N.Y.
Vavroch, Duane P. ('70), West Des Moines, Iowa
Walrath, Howard D. ('59), Plano, Tex.
Wright, James C. ('67), Redmond, Wash.
Wollmershauser, Barbara B. ('75), Tulsa, Okla.
Woodworth, Brian R. ('84), Wayne, N.J.
Woolover, Earl J. ('48), Beaver, Pa.

**MECCA Club**

Bell, Robert T. ('47), Munster, Ind.
Bratney, Kenneth E. ('48), Waukee, Iowa
Brink, Eric J. ('78), Albany, Calif.
Brink, Richard E. ('44), White Bear Lake, Minn.
Carlson, Robert A. ('51), Janesville, Wis.
Carlson, Alan L. ('86), Cedar Rapids, Iowa
Carlson, Frederic A. ('50), Decorah, Iowa
Carson, William L. ('64), Columbia, Mo.
Covert, Richard P. ('59), Lexington, Ky.
Daniels, Dale E. ('65), Fountain Valley, Calif.
Dinzo, John W. ('52), Crystal Lake, Ill.
Dubrow, Morgan D. ('41), Arlington, Va.
Godfrey, Gary L. ('76), Cedar Rapids, Iowa
Greave, Janet L. ('78), West Des Moines, Iowa
Hall, Jerry B. ('83), Johnston, Iowa
Hill, Jared S. ('59), Cedar Rapids, Iowa
Hoang, Bach N. ('85), San Diego, Calif.
Hubbard, Philip G. ('46), Iowa City, Iowa
Hughes, John R. ('42), Buffalo, N.Y.
Johnson, Dean H. ('43), Orion, Ill.
Johnson, Paul E. ('40), San Rafael, Calif.
Johnson, Robert W. ('56), Elgin, Ill.
Jorgenson, James S. ('42), Phoenix, Ariz.
Kam, Ah Leong ('49), Honolulu, Hawaii
Kasch, Howard ('39), Scotia, N.Y.
Koelzer, Victor A. ('39), Fort Collins, Colo.
Larson, V. Gilbert ('64), Omaha, Neb.
Laussen, Verne H. ('58), Fort Wayne, Ind.
Lentfer, Jim ('80), Cupertino, Calif.
Liong, Shie-Yui ('77), Singapore, Singapore
Lunsman, Fred W. ('37), Arlington Heights, Ill.
Mitter, Wayne S. ('43), Honolulu, Hawaii
Mosher, Kenneth R. ('34), Sioux City, Iowa
Myers, Gerald E. ('60), West Des Moines, Iowa
Nielsen, Kenneth P. ('70), Aurora, Ill.
Perry, John G. ('71), Gambrells, Md.
Pipilani, Om Prakash ('55), West Caldwell, N.J.
Pipilani, Ratam P. ('58), Chapel Hill, N.C.
Ruisch, Robert G., Jr. ('64), Leawood, Kan.
Sacks, Newton N. ('41), San Diego, Calif.
Schmickle, Richard K. ('55), Libertyville, Ill.
Schroeder, Darwin E. ('60), Bettendorf, Iowa
Sheehan, Lynette S. ('88), Loudonville, N.Y.
Shuih, Lewis M. ('42), Davenport, Iowa
Sloat, Sirli A. ('79), Hackettsown, N.J.
Smith, Richard K. ('60), Fairfield, Iowa
Spangler, Karen M. ('85), North Royalton, Ohio
Stachovic, Edward L. ('53), Cedar Falls, Iowa
Stearns, Robert P. ('60), Playa Del Rey, Calif.
Stewart, Richard B. ('46), Moscow, Idaho
Wilcox, Lisa K. ('81), Iowa City, Iowa
CLASS NOTES

1930s

Loren D. Millard (B.S.M.E. '34) retired in 1977 from Adolph Coors, where he was in charge of bottle line engineering. He lives in Pueblo, Colo.

Cecil J. Porter (B.S.M.E. '39) is retired and lives in Marshalltown, Iowa. Porter worked as a chief engineer at two Marshalltown concerns, first at Kiowa Corp. and then at Marshalltown Manufacturing Company. Later he taught manufacturing processes at Marshalltown Community College. Porter has been president of the Rotary Club and just finished a term as secretary.

1940s

Lawrence Fritz Stotts (B.S.C.E. '40) is retired from Rohr Industries. Chula Vista, Calif., where he was corporate manager of construction.

David K. Hart, P.E. (B.S.M.E. '41) is president of the company he and his wife own. The David K. Hart Company, Inc., designs and manufactures rotary diecutting accessories for business forms printing presses. The Harts reside in Rosemont, Penn.

Edward M. Lonsdale (M.S. '41, Ph.D. '45) is an adjunct professor of electrical and computer engineering at the University of Arizona. He lives in Tucson.

Richard (Dick) B. Olney (B.S.Ch.E. '41, M.S. '42) retired from Shell Development Co. in January 1969. He lives in San Diego, Calif., and has served on that city's Clean Air Council and the San Diego County Air Pollution Control Hearing Board. He also taught process design for two years at the University of California--San Diego.

Russell W. Reveil (M.S. '41) is retired and lives in Anacortes, Wash.

Edward H. Schneckloth (B.S.M.E. '42) is retired from Lockheed Burbank, Calif., where he was manager of market engineering. He lives in Sherman Oaks. Schneckloth recently published an article in the Lockheed Starhustler newspaper on his 1976 visit to Russia.

1950s

Robert A. Long (B.S.M.E. '43) is retired from Thiokol Corporation, where he was a supervisor in plant engineering. Long lives in Brigham City, Utah.

Norman I. Stein (B.S.M.E. '43) retired in 1988 after 44 years of civilian service in the Navy. He lives in Potomac, Md.

Richard B. Oswin, Jr. (B.S.C.E. '45) retired as a partner of Moss Adams, a regional CPA firm in Washington state. Over the years he has worked as an electrical engineer, a civil engineer, and a CPA. He lives in Yakima, Wash.

Donald E. Johnson ('49) is president of Esping Forensic Engineering Inc., specialists in steel structures. He lives in Plymouth, Minn.

Donald A. Edwards (B.S.E.E. '50) is retired from General Electric, where he was an account manager. He reports that he plays at least 80 rounds of golf and skis 40 days each year.

Samuel A. Jolly, Jr. (M.S. '50) is retired from the Rohm and Haas Company. The Titusville, N.J., resident says his career has included positions as chemist, control lab forman, junior/senior engineer, engineering group leader, chief chemical engineer, quality assurance group leader, product/raw material coordinator, and senior staff associate.

Lindsay Lenhart (B.S.E.E. '53) is owner and president of Lenhart Associates. Lenhart lives in Northfield, Ill.

Harry W. Nelson (B.S.C.E. '53) is retired after 37 years with the Iowa Department of Transportation. He lives in Sioux City, Iowa.

Edwin Anderson (B.S.Ch.E. '56) is retired from Mobil Oil. He also worked for DuPont and Foster Grant. Anderson was awarded two patents and was involved in $3 billion worth of construction during his career. He lives in Newtown, Penn.

Gene W. Kopp (B.S.E.E. '56) retired in 1989 after 20 years at AT&T. In 1990 he began teaching mathematics at East Central College, in Union, Missouri. Kopp lives in Marshallville, Mo.

Robert A. Long (B.S.C.E. '57) is president and C.E.O. of George Breslaw & Sons Inc. plumbers, where he has worked for 37 years. He lives in Fairlawn, N.J.

Ralph Carey Hill (B.S.M.E. '57) retired in 1992 from General Dynamics--Fort Worth. Hill designed and developed aircraft fuel systems and was on the United States Air Force accident investigation teams. He lives in Fort Worth with his wife, Priscilla.

Jim Kaster (B.S.M.E. '57) retired in April 1993, after 37 years with3M. He recently was appointed chair of the trust advisory committee for Tau Beta Pi national engineering honor society. Kaster lives in Woodbury, Minn.

Francis (Jeff) Jeffries (B.S.E.E. '58), chair and C.E.O. of Duff & Phelps Corp., Chicago, Ill., has been inducted into the Entrepreneur Hall of Fame, organized by the University of Illinois. He lives in Chicago.

Larry Roth (B.S. '58) recently retired from General Electric after 36 years as a naval and commercial nuclear design engineer. He lives in Wilmington, N.C.

Gary R. Long (B.S.M.E. '59) has been appointed president of Cal-Comp Inc., a Lockheed company and provider of computer graphics peripherals. Cal-Comp's headquarters are in Anaheim, Calif.

Robert M. Workbahn (B.S.E.E. '59) is manager of the safeguard and security department at Sandia National Laboratories. He lives in Tijeras, N.Mex.

1960s

Robert F. Scholl (B.S.Ch.E. '60) retired in 1953 as a senior engineering specialist at Monsanto Co. He lives in Pensacola, Fla.

Jesse Shore (B.S.M.E. '60) retired from the U.S. Army Corps of Engineers in 1990. Shore lives in Manchester, Tenn.

Donald E. Van Cleave (B.S.M.E. '60) is retired and lives in Palatine, Ill.

Richard O. Whitney (B.S.C.E. '60) is president and C.E.O. of DPI Services, Inc., and lives in San Jose, Calif.

Richard B. Konzen (B.S. '61, M.S. '64, Ph.D. '70) is associate professor emeritus of nuclear engineering at Texas A & M. He lives in College Station, Tex., and enjoys travel, fishing, and golf.

Larry J. Harmsen (B.S.Ch.E. '62) is vice president of stepping and low inertia motors at Pacific Scientific. He lives and works in Rockford, Ill.

Richard Wm. Tock (B.S. '63, M.S. '64, Ph.D. '67) is professor of chemical engineering at Texas Tech and lives in Lubbock. Tock enjoys visiting with fellow Iowa alumni at AICHE meetings.

Larry E. Reynolds ('64) is president of Metro Style, Inc. He lives in Helenville, Wis.

Franklin D. Moore (Ph.D. '66) taught electrical engineering for 11 years at The University of Iowa, Purdue University, and George Washington University before entering federal service, where he worked as senior electronics engineer with the Defense Information Systems Agency and the National Security Agency. Moore lives in Arlington, Va.

Philip W. Parsons (B.S.C.E. '66) lives and works in Minneapolis, where he is president and owner of Parsons Engineered Products, Inc. The company, which just passed its ten-year anniversary, serves the water and waste water marketplace in Minnesota, Wisconsin, and the Dakotas.

Arthur H. Becker (B.S.E.E. '67, M.S. '68) lives and works in Boone, Iowa, where he is an engineer at Fareway Stores, Inc.

Robert "Bob" Wubbena (B.S.C.E. '66, M.S. '68) worked nine years for Washington state's department of health, where he was responsible for developing water system management strategies. He then founded Economic and Engineering Services, Inc. Wubbena is president-elect of the American WaterWorks Association and lives in Olympia, Wash., where he participates in the Chamber of Commerce and Habitat for Humanity. Bob says he enjoys skiing, travel, reading, and boating.

Frank Coppie (B.S.C.E. '68) recently was named vice president of Latin American operations at Stanley Tools, Miami, Fla.

Michael E. Duffey (B.S.M.E. '68) is professor of physiology, school of medicine, at SUNY-Buffalo. He lives in Amherst, N.Y.

1970s

Terry L. Martin (B.S.M.E. '71) is president of Brown Engineering Company, a West Des Moines engineering consulting firm. Martin lives in Des Moines.

Gary E. Seamans (B.S.E.E. '71) is chair and C.E.O. of Electronic Information Technologies, Inc., Osceola, III. Seamans lives in St. Charles, Ill.

Gerald Lea Stutz (B.S.E.E. '71) is assistant to the president at The Stutz Company, which manufactures equipment and abrasive compositions for the metal finishing industry. Stutz recently received a certificate in business administration from the University of Illinois-Chicago Circle and is the Chicago branch news reporter for the American Electroplate and Surface Finishers Society. He lives in Glenview, Ill.

Charles J. Chapman (B.S.E.E. '72) is senior vice president of sales and marketing at A.O. Smith Automotive Products. He lives in Milford, Mich.

Leon D. Baxter (B.S.E.E. '73) is chief engineer at the Iowa Army Ammunition Plant. He received the 1992 Secretary of the Army Environmental Quality Award (Individual Category) and honorable mention in the Defense Department Environmental Quality Award competition. Baxter lives in Fort Madison.

Curtis L. Gunnarson (B.S.E.E. '73) is manufacturing engineering manager at the Grinnell Corporation in Cleveland, N.C. He lives in Salisbury, N.C.

Shee Ho (M.S. in EE '73) lives in Champaign, Ill.

Jim Schroeder (B.S.E.E. '76, M.S. '78) is assistant professor of electrical engineering at the University of Denver. He is editor of DSP and his book Elements of Digital System Design was released in October 1993.

Les L. Kuehl (B.S.Ch.E. '78) joined NNW, Inc.--Consulting Engineers in February 1993 and is vice president and secretary of the corporation. He lives in Coralville, Iowa.

Karen J. (Bartos) Boyd (B.S.Ch.E. '78) was promoted to principal engineer at Hoffmann-La Roche, Inc., upon her return to work after the birth of her second child.
CLASS NOTES

She was elected to the International Who's Who of Professional and Business Women in 1993. Boyd lives in West Caldwell, N.J.

1980s

Sue (Aitchison) Schenck (B.S.E. '81) is distribution operations planner at 3M. She lives in Woodbury, Minn.

Tom Beckman ('81) is manager of waste management for Waste Management, Inc. in Richardson, Texas.

David R. Bubb (B.S.E. '81) is senior structural engineer at OW & P & Architect Inc., where he is responsible for the design of institutional and commercial projects. He lives in Lake Forest, Ill. with his wife, Katie, and children, Mary and Will.

Robert C. Lee (B.S.E. '82) is a technical director with the Collins General Aviation Division of Rockwell International, where he is responsible for projects with Beech Aircraft in Wichita and Israel Aircraft in Tel Aviv. Lee lives in Cedar Rapids, Iowa.

Payam Maveddat (B.S.E. '82), manager of systems engineering for Bell Northern Research, lives in Richardson, Texas.

Richard P. Thompson (M.S. '83) is regional environmental manager for Waste Management Inc. He lives in Pleasanton, Calif.

Dharmvir Krishan Bhatnagar (M.S. '94) is environmental engineer for the Iowa's Division of Soil Conservation. Bhatnagar has presented technical papers at three American Society of Surface Mining and Reclamation conferences. His son graduated in bioelectric engineering from M.I.T. in May 1994.

Donald D. Anderson (B.S.E. '85, M.S. '86, Ph.D. '89) directs the biomechanics research laboratory at Allegheny-Singer Research Institute, Pittsburgh, Penn. In January he received a three-year grant from the Whitaker Foundation for a project entitled "A combined experimental and computational approach to the identification of relevant mechanical parameters in intra-articular distal radius fractures." Anderson lives in Pittsburgh.

Michael Hintze (B.S.E. in BE '85) is product manager in obstetrics at Utah Medical Products, Inc. He lives in Sandy, Utah.

Doug Kurszchinski (B.S.E. in BE '85) recently was named manager of clinical programs at St. Jude Medical, Inc., a prosthetic heart valve manufacturer. He lives in Woodbury, Minn.

William R. White (B.S.E. in EE '85) reports that he uses many of the engineering skills he learned at Iowa in his work as a test systems engineer for General Dynamics Corp. and for Northrop Corp., working with the Tomahawk Cruise Missile, B-2 Bomber, and F-15 ECM programs. He lives in Downers Grove, Ill.

Mike Arn (B.S.E. in IE '86) is work control coordinator at the Balcones Research Center at the University of Texas-Austin.

Peter K. Hahn (B.S.E. in ME '86), a San Diego, Calif. attorney, recently joined Luce, Forward, Hamilton and Scripps as head of the intellectual property group of the firm's business law department. He specializes in patents, trademarks, copyrights, trade secrets, and related litigation.

David Bloesch (B.S.E. '87) is a design engineer for Products Unlimited. He lives in Iowa City.

Jeffrey M. Gabby (B.S.E. in ChE '87) served 18 months with his National Guard unit in the Persian Gulf during Desert Storm. In 1992 he joined the Michigan Department of Natural Resources, Air Quality Division, as an environmental engineer. He lives in Essexville, Mich.

John P. Kepros (B.S.E. '87) graduated from The University of Iowa College of Medicine in 1991 and now is in general surgery residency at Michigan State University. He lives in Haslett, Mich.

Ian Law (B.S.E. in BM '88) is a pediatric resident at the University of Michigan. He and his wife, Laura Frey Law, live in Ann Arbor.

Cheryl MacLeod (B.S.E. in BE '88) recently earned a Ph.D. in chemical engineering from the University of California-Berkeley. MacLeod works as a hardware design engineer at Hewlett-Packard in Corvallis, Oreg.

Kurtis G. Paterson (B.S.E. '88, M.S. '90, Ph.D. '93) recently was appointed assistant professor of environmental engineering at Michigan Technological University, where he is a faculty adviser for women in engineering and minorities in engineering summer programs. He also is co-adviser for Michigan Tech's chapter of the Society of Women Engineers. Paterson lives in Houghton, Mich.

John A. Gerlach (B.S.E. in ME '89) is project engineer at Weatherford International, where he designs and tests cranes used on the offshore oil market. He lives in Houston, Tex.

Shankar G. Hemmady (M.S. in EE '89) is senior engineer at Sunrise Test Systems. He lives in Cupertino, Calif., and writes that he and his wife value their experience in Iowa as "the best career development time of our lives."

Steve J. Martin (B.S.E. in ME '89) is working as project engineer at BWI KartridgePak. Martin lives in Bettendorf, Iowa.

James R. Seitz (B.S.E. in IE '89) credits an on-campus interview with enabling him to land his first job as an industrial engineer with Murray Turbomachinery, where he now serves as manufacturing engineering manager. He lives in West Point, Iowa.

1990s

Mary Bergs (Ph.D. '90) is an assistant professor of civil engineering at the University of Toledo, in Toledo, Ohio.

Darian Dejong (B.S.E. '90) is a specialist in continuous improvement engineering for Pella Corporation, Carroll, Iowa.

Jana (Ellestad) Livermore (B.S.E. in ChE '90) is an engineer for Environment Inc. She lives in Houston, Texas, with her husband, Douglas.

Hassan Elzein (B.S.E. in CE '90) works as a civil engineer for the New York State Department of Transportation. He lives in Farmingdale, N.Y.

Laura Frey Law (B.S.E. in BM '90) is a graduate student in bioengineering at the University of Michigan. She lives in Ann Arbor with her husband, Ian Law.

John D. Gaich (B.S.E. in CE '90) works as an environmental manager at 132 Fighter Wing IA Ang. Gaich lives in Des Moines.

Kimberly L. Garbow Horne (B.S.E. in ME '90) lives and works in Texarkana, Tex., where she is a quality assurance process engineer for International Paper.

Christopher M. Protzman (M.S. in IE '90) lives and works in Ogden, Utah, where he is management engineer at McKay-Dee Hospital Center. Protzman reports that he applies his engineering skills to improvement of quality and service at the lowest possible cost to patients.

Brian J. Beneke (B.S.E. in ChE '91) works as a chemical/environmental engineer at EES Utilities, Inc., Cedar Rapids, Iowa. Beneke lives in Iowa City.

John B. Giegerich Jr. (B.S.E. in EE '91) has joined the Dakota Electric Association as a commercial/industrial representative after spending two years as an electrical designer at Koch Refining Company.

James R. Jackson Jr. (B.S.E. in CE '91) recently returned to Iowa City to pursue a master's degree in environmental engineering. He continues to work as a staff engineer for the Howard R. Green Company.

Douglas Livermore (B.S.E. in ChE '91) is a project engineer for Exxon Chemical Company. He lives in Houston, Texas, with his wife, Jana (Ellestad).

Monica M. Petersen (B.S.E. in CE '91) is enrolled in a joint University of Montana/Peace Corps master's program. In June of 1995 she plans to depart for a Peace Corps assignment in South America.

Casey Schrock (B.S.E. in ME '91) lives and works in Newton, Iowa, where he is a manufacturing engineer in tooling at Maytag.

Steve Andretich (B.S.E. in ChE '92) is mill/elevator supervisor for Cargill Inc. and recently was promoted to department head. He handles the budgeting and engineering needs for two departments and trains co-ops and interns. Andretich lives in Iowa City.

William (Bill) F. Nystrom (B.S.E. in CE '92) is a civil engineer and project engineer for Amoco Chemical Company. He lives in Webster, Tex.

Mathew M. Shurtliff (M.S. '92) is an environmental scientist for CH2M Hill, Gainesville, Fla.

Scott Vandenburg (B.S.E. in CE '92) works as a water resources engineer with the Peace Corps in the Republic of Mali, West Africa.

Mary Walljasper (B.S.E. in IE '92) is working on her master's degree in industrial engineering at Bradley University and is employed at Methodist Medical Center in Peoria, Ill., as a process engineer. Walljasper writes that she is heavily involved with quality improvement and teaching industrial engineering tools at the hospital.

S. Keith Hargrove (Ph.D. '93) is assistant professor of mechanical engineering at Tuskegee University, where he recently was named departmental Teacher of the Year.

Art Manhica (B.S.E. in EE '93) writes that he loves every one of the many responsibilities he holds as computer engineer for Midwest Power. Manhica, who lives in Sioux City, says he plans to begin graduate study at Iowa State University.

Tim Savard (B.S.E. in EE '93) is an application engineer for ElectroMatic Controls Corporation. He lives in Barrington, Ill.

Michael D. Stailey (B.S.E. in EE '93) is a senior design engineer for Motorola. He lives in Arlington Heights, Ill.

Scott E. Stolte (B.S.E. '93) is doing master's degree work at the University of Michigan-Ann Arbor.

Martin Teal (M.S. '93) is a project engineer for WEST Consultants, Inc. He lives in San Marcos, Calif.

In memoriam

Vernon V. Holmes (B.S.E.E. '31), of Sioux City, Iowa, January 16, 1994.


John A. Compton (B.S.E. in ChE '89), of Davenport, Iowa, July 12, 1993.
**Biomedical Engineering**

The department hosted the 17th annual meeting of the Society of Biomechanics in October 1993. Scientific peers from all over the world attended the conference, as did a record number of industrial exhibitors. The conference was sponsored by several organizations, including the Whitaker Foundation and 3M.

During the 1993-94 academic year the department became a charter member of the Academic Council of the American Institute for Medical and Biomedical Engineering.

The department was awarded a Ford Foundation Baccalaureate Incentive Award in support of recruiting minority graduate students, also in 1993-94.

**Faculty**

Tom Brown, professor, has been elected to the grade of fellow of the American Institute of Medical and Biological Engineering. Brown currently is president of the American Society of Biomechanics.

K.B. Chandran, professor, presented a paper, "Cavitation dynamics on the mechanical heart valve prostheses," at the joint congress of the International and European Societies for Artificial Organs, July 1993 at Amsterdam.

Vijay K. Goel, professor and chair, has been elected to the editorial board of European Spine Journal and to the grade of fellow of the American Institute for Medical and Biological Engineering. Goel won the Volvo Award for his paper "Interlamellar shear stresses and laminae separation in a disk: Finite element analysis of the L 3-4 motion segment subject to axial compressive loads." It was Goel's third Volvo Award. He also was cited in Who's Who in Science and Engineering (2nd edition), 1993.

Goel is serving a three-year term as chair of the Solids Mechanics Committee, American Society of Mechanical Engineers bioengineering division, and is chair of the muscle mechanics session of the society's annual winter meeting. He also serves as consultant to the American Academy of Orthopaedic Surgeons subcommittee on adult spine evaluation.

In May 1993 Goel presented two papers at the International Conference on Spinal Surgery at Taipei.

Taiwan: "Effects of rigidity of a fixation device on lumbar spine mechanics—a comprehensive biomechanical investigation" and "Biomechanics of spine as a function of muscles."


Joon B. Park, professor, has been elected to the editorial board of Journal of Biomedical Engineering. Park also is biomaterials section editor for the forthcoming CRC Handbook on Biomedical Engineering.

In August 1993 Park presented a paper, "Methods to improved mouthguards," at the First International Symposium on Biomaterials, Korea Institute of Chemical Technology, Taegon.

**Students**

Trina Bhur (B.S. '93) was awarded both the Whitaker Foundation Fellowship and the National Science Foundation Fellowship. Buhr also was the triple crown winner of the 1993 Hancher-Finkelkian Medalion Award, the Susan Hancher Award, and the Virgil M. Hancher Scholarship. She is the only student in The University of Iowa's history to win all three awards.

Nancy Caldwell (B.S. '91) was awarded a National Science Foundation Fellowship for 1993.

Tanya Shipkowitz, graduate student, was awarded a NASA Fellowship to pursue her doctorate in biomedical engineering.

Bryan Monore (M.S. '93) won third place in the American Society of Mechanical Engineers Student Award competition.

Lin Ricks-Williamson, University of Iowa dental resident working under the supervision of Vijay Goel, won the third place Poster Award at the American Dental Association annual meeting and the second-place Student Research Award from the International Association for Dental Research in May 1993.

Brooke Gajeski, junior from Davenport, Sarah Pingsten, sophomore from Boydien, Iowa, and Cathy Russell, junior from Cedar Rapids, were awarded 1993-94 teaching internships.

Nicole Grosland, junior from Fort Dodge, Iowa, and Janie Myrstol, junior from Gillette, Wy., won General Electric internships for academic year 1993-94.

**Chemical and Biochemical Engineering**

**Faculty**

Jonathan Dordick, professor, has been elected to the editorial boards of two journals, Enzyme and Microbial Technology and Applied Biochemistry and Biotechnology. Dordick also has been named chair of the 13th Enzyme Engineering Conference, 1995.

David W. Murhammer, assistant professor, has been named patent and literature review editor for the Journal of Applied Biochemistry and Biotechnology.

Victor G. Rodgers, assistant professor, was appointed to a two-year term (1994-96) as national chair of the Minority Affairs Committee (MAC) for AIChE.

**Students**

The University of Iowa's AIChE student chapter was chosen for an Outstanding Student Chapter Award for 1993-94. It was the second straight year the chapter had won the award.

Richard Arndt, graduate student, presented a paper, "The long-range transport of sulfur in Asia," at the National American Meteorological Society meeting, February 1994 in Nashville.

Kevin Crist, graduate student, presented a paper, "Evaluation of radiative flux and tropospheric chemistry under global climate change scenarios," December 1993 at NATO, in Spain.


Yang Zhang, graduate student, presented a paper, "Effects of yellow sand on the photochemical processes in East Asia," to the World Congress III on Engineering & Environment, October 1993 in Beijing, China.

Lisa Holle, senior from Ankeny, was one of ten students in the nation to receive an AIChE Student Chapter National Scholarship Award, which recognizes academic excellence and involvement in AIChE and other professional activities. The award carries a $1,000 stipend.

Jennifer Monroe, senior from Davenport, received a 3M Focused College Relations Scholarship, which includes a summer internship at 3M's Dental Products Division in St. Paul and a $5,000 award for the academic year.

**Civil and Environmental Engineering**

**Faculty**

Jasbir S. Arora, professor, is associate editor for the ASCE Structures Division Journal.

Arora gave four lectures in Japan in May 1993 at the invitation of Tokyo Denki University: "Optimal design with finite elements," Tokyo Denki's Hatoyma campus; "Structural optimization: Some thoughts on practical applications," Tokyo Denki Kanda campus; "Design sensitivity analysis and optimization of nonlinear structures," Waseda University; "A variational principle for design sensitivity analysis of nonlinear structures," Kyoto University.

In addition, Arora presented "Structural optimization..." as the keynote lecture and chaired the session on optimization in nonlinear analysis at the OF1 '93 Third International Conference, Computer-Aided Optimum Design of Structures, July 1993 in Zaragoza, Spain. He also presented "Design sensitivity analysis..." at the COMMET short course Optimum Design in Structural Optimization in Zaragoza.

Dan E. Branson, professor emeritus, was awarded the 1994 James M. Robbins Excellence in Teaching Award by Chi Epsilon, the national civil engineering honor society.

Forrest M. Holly, professor, received the 1994 College of Engineering Faculty Service Award (see story on page 13).

Forrest M. Holly, A. Jacob Odaagaard, and Jerald L. Schnoor, professors, and Tatsuki Nakato, adjunct assistant professor and research engineer, attended the 25th IAHR Congress, August 1993 in Tokyo, Japan. Schnoor presented invited lectures, and Odaagaard was co-chair of a technical session on hydraulic structures.

Witold F. Krajewski, associate professor, received the Honorary Gold Medal of Poland's Institute of Meteorology and Water Management. The institute is a government agency responsible for weather forecasting, environment monitoring, and water resources management, including reservoir operation.

A. Jacob Odgaard, professor, has been elected chief editor of Journal of Hydraulic Engineering, published by the American Society of Civil Engineering.

Wayne L. Paulson, professor, received the Harris F. Seidel Award of the Iowa Water Pollution Control Association at the association's annual meeting June 10 in Des Moines. The award recognizes exemplary service in water pollution control and the environmental sciences through education, training, and motivation.

Jerald L. Schnoor, professor, served as president of The University of Iowa Faculty Senate this past academic year. He also is an associate editor for the Journal of Environmental Science and Technology.

Richard Valentine, associate professor, has been elected to the Iowa Section board of directors for the American Water Works Association.
DEPARTMENTAL NOTES

Students
Levi Brekke, senior from Klemme, Iowa, was presented with the Outstanding Senior of the Year award at the September 1993 awards banquet of the American Society of Civil Engineers, Iowa Section.
David Mitchell, senior from Iowa City, received an Iowa Section Scholarship at the banquet.
Jeffrey Barlow, graduate student, received first prize in the Midwest Transportation Research Center student paper contest (see story on page 18). Barlow attended a Transportation Research Board conference in Washington, D.C., where he received a cash award of $1,000 and a $3,000 scholarship from Concrete Reinforcing Steel, Inc.
Fangbiao Lin, graduate student, presented a paper, “Hydraulic engineering challenges in space,” at the third annual Iowa Space Institute of the American Society of Engineering Faculty Teaching Award (see story on page 13).
Steve M. Collins, professor, received the University of Iowa College Teaching Award for 1993-94 and the 1994 College of Engineering Faculty Teaching Award (see story on page 13).
Thomas Casavant, associate professor, presented papers at several conferences: International Summer Institute on Parallel Computer Architecture Languages and Applications, June 1993 at Prague, Czech Republic; the International Symposium on Automotive Technology and Automation Dedicated Conference on Supercomputing, and the 14th Speedup Workshop on Parallel and Vector Computing, September 1993 at Aachen, Germany, and Zurich, Switzerland; Workshop on Parallel Computing Architectures, November 1993 at Lacaunau, France; Conference on Massively Parallel Scientific Computing, March 1994 at Ascona, Switzerland. Casavant attended the PLSA ’94 conference at Zurich, Switzerland, and visited at ETH Zentrum, IFW, in Zurich, Switzerland. He also traveled to Moscow, Dubna, and St. Petersburg, Russia, to hear and deliver talks.
Dong Chung, professor, presented an invited talk at the International Conference on Systems, Man, and Cybernetics, October 1993 at Le Touquet, France.
Soura Dasgupta, associate professor, attended the IFAC World Congress Conference, July 1993 at Sydney, Australia. Dasgupta also visited at the Australian National University.
Jon Kuhl, professor, and Balkrishna Ramkumar, assistant professor, attended the International Parallel Processing Symposium 1994, in April at Cancun, Mexico.
Karl E. Lonngren, professor, received the 1994 College of Engineering Faculty Research Award (see story on page 13).
Irit Pomeranz, associate professor, received the Best Paper Award at the Euro-DAC conference. This is the second consecutive year Pomeranz has received the award. Two of Pomeranz’s papers were nominated for the award this year.
Sudhakar M. Reddy, professor and chair, presented a talk at the International Colloquium on Design Automation, August 1993 at Saarbrucken, Germany. Reddy presented a paper at the International Conference on VLSI and CAD, November 1993 at Seoul and Daejeon, South Korea.
Milan Sonka, visiting associate professor, presented lectures at the computer vision conferences held in August 1993 at Amsterdam, Brussels, and London.

Electrical and Computer Engineering

Faculty
David R. Andersen, associate professor, presented a paper at the OSA annual meeting, October 1993 at Toronto, Canada.
Mark S. Andersland, assistant professor, received the University of Iowa College Teaching Award for 1993-94 and the 1994 College of Engineering Faculty Teaching Award (see story on page 13).
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Students
Five Industrial Engineering students are participating in the Midwest Transportation Institute’s Transportation Scholars Program: Mike Mollenhauer, graduate student; Tim Brown, senior from Bettendorf; Stefan Hofmeyer, senior from Atlantic, Iowa; Brian McKinney, senior from Chariton, Iowa; and Thuy Tran, senior from Marion, Iowa. All five won scholarships to participate in advanced automotive research using simulation facilities at the Center for Computer-Aided Design.

Mechanical Engineering

Faculty
James R. Buck, professor, attended the spring 1993 Ergonomics Society conference in Edinburgh, Scotland.
Thomas A. Dingus, professor, has been appointed associate professor, and has returned from leave at University College, London, where he was an honorary research fellow in 1993.

Students
Virendra C. Patel, professor, served as a United Nations consultant in India during December 1993 and January 1994. He reviewed research projects in experimental and computational fluid mechanics and lectured at the Indian Institute of Science and at the National Aerospace Laboratories, both in Bangalore; the Indian Institute of Technology, Madras; and the Indian Institute of Technology, Kanpur. Patel has been named director of the Iowa Institute of Hydraulic Research (see story on page 12).

Industrial Engineering

Faculty
P. Barry Butler, associate professor, has been appointed associate editor of Journal of Propulsion and Power, published by the American Institute of Aeronautics and Astronautics.
Kyun K. Choi, professor, has been serving as an associate editor of Journal of Optimization Theory and Applications since October 1993.
Choi presented an invited plenary session paper, “Large-scale tracked vehicle concurrent engineering environment,” and served as an advisory board member for The World Congress on Optimal Design of Structural Systems, August 1993 at Rio de Janeiro, Brazil. Choi was invited to present a case study, “Noise, vibration, and harshness optimization of auto body structure,” at the 1994 NSF Design and Manufacturing Systems Grantees Conference, January 1994 at M.I.T. Choi’s research for the study was supported by Ford Motor Co., which is manufacturing six cars in order to test Choi’s optimization methodology (see story on page 8).

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Ralph L. Stephens, professor, presented three lectures on fatigue, fracture mechanics, and engineering education at Samara State Aerospace University, Samara, Russia, May/June 1993. Stephens also spoke on “Corrosion fatigue of AZ91-T6 magnesium alloy” at Madrid Polytechnical University, Madrid, Spain, June 1993. Stephens spoke on “Fatigue behavior and life prediction for AZ91-T6 cast magnesium alloy” and was the U.S. representative on a panel, “Teaching and education in fatigue and fracture,” at the International Congress on Fracture, June 1993 in Kiev, Ukraine.