Lasers and Holograms   Stephen Wadle, a graduate student in mechanical engineering, checks the path of a laser beam. Wadle is working in the biomedical engineering laser holography laboratory, where lasers are used to create holograms that have a wide array of applications in engineering, from measuring stress on bones to improving liquid crystal readouts for vehicle control panel instrument displays. One of Wadle's projects involves heads-up displays, in which instrument readouts are projected onto a half-clear mirror on the front window of an airplane or automobile, permitting the pilot or driver to read the instrument display and, at the same time, look through it at the outside environment. Wadle works with Roderic Lakes, professor of biomedical engineering and mechanical engineering and director of the laser holography laboratory.
Dean Looks Forward to Teaching, Learning; Shares Pride in College’s Accomplishments

I write my last column as dean with mixed emotions. On the one hand, I look forward to returning to full-time faculty responsibilities and the excitement of classroom teaching and learning, as well as contributing to the expansion of knowledge. On the other hand, I will miss the interactions with our faculty, staff, and students, engineering deans at other institutions, advisory board members, alumni, and friends—which are so much a part of serving as dean.

Looking back across the nearly 20 years that I have been dean, I see many accomplishments to which all of our constituencies have contributed. We all share with pride the college’s advancement.

Our undergraduate students are outstanding and their number is appropriate. All of our undergraduate programs are of high quality. Graduate-level education is strong. We have an excellent faculty; ample evidence of that is available from classroom teaching results, ABET reports, degree-granting productivity, external fund expenditures, and scholarship. Each department has advanced in national stature through the efforts of its students, faculty, staff, and leadership.

The Iowa Computer-Aided Engineering Network continues to be a national leader among instructional resources. The continued success of the Institute of Hydraulic Research is a source of pride for the college, as is the development of another steeple of academic excellence, the Center for Computer-Aided Design.

The college uses all of its resources effectively and efficiently. Through its many and varied interactions with other University of Iowa colleges, it also plays an important role in fulfilling the mission of the University.

I wish to thank each of you for the contributions you have made to advancing the College of Engineering. Some of you have made extraordinary contributions to the college’s advancement in the past; many of you will do so in the years ahead.

Of the many who have made substantial contributions to the college, I am especially grateful to those with whom I have worked closely for many years in the dean’s office. First and foremost is Associate Dean Paul Scholz, whose efficiency, effectiveness, initiative, and commitment to advancing academic excellence in our college has given me the opportunity to continuously pursue resources that will advance the college. Norlin Boyd, Doug Eltoft, Art Pudgil, Becky Rowe, and Ron Wheat have long been key members of a superb staff.

Faculty leadership at the department, center, and institute level has been and continues to be a major contributor to advancement of the college, and I especially wish to acknowledge those leaders on whom I have relied so much over the last decade or more: Gregory Carmichael, Marty Chen, Ed Haug, the late Jack Kennedy, Sudhakar Reddy, and Kwan Rim.

From the faculty, I wish to acknowledge Steve Collins, George Lance, V.C. Patel, and Jerry Schnoor for their valuable counsel. I learned much from every one of these special people.

I leave the deanship confident that in the years to come, the College of Engineering will far exceed its past accomplishments. It will do so because its faculty, staff, students, leadership, alumni, and friends care enough about it to intensify their efforts and expand their participation, thereby assuring the college’s continuing rise to preeminence.

Thank you for letting me serve as dean and be part of a great organization.

Robert G. Hering, Dean
Waves by the Thousands
Fred Stern (far left) and Joe Longo watch while Eric Paterson, Jung-Eun Choi, and Yusuke Tahara (left to right) prepare an experiment at the towing tank facility in the basement of the Institute of Hydraulic Research. Longo, Paterson, Choi, and Tahara are graduate students who collaborate in Stern's studies of ship hydrodynamics and fluid mechanics. In one experiment, the researchers towed a model down the 100-yard-long tank four thousand times in order to make an accurate determination of wave boundary interactions.

America's Cup Hopefuls Turn to Hydrodynamics Expert

When the designers of the yacht that will enter the next America's Cup race decided they needed help designing an improved boat hull, they turned for advice to Fred Stern in landlocked Iowa. Stern grew up in upstate New York and crewed for many childhood summers on his father's thirty-foot sloop, a Graves Constellation. Now an associate professor of mechanical engineering, Stern specializes in ship hydrodynamics at the Institute of Hydraulics Research.

Since coming to the University ten years ago, Stern has studied fluid mechanics and the flow of water around ship hulls and propellers.

His first area of interest is propellers and propeller/hull interaction. As Stern explains, "unlike the propeller of an airplane, a ship's propeller is in back, buried in the flow of the vessel. There is, therefore, an interaction between the ship's flow and the propeller's flow." Stern's work in the field has sparked a new research interest in the flow of water across the blades themselves.

Stern's second major research area focuses on waves and how they interact with the ship's boundary layer and wake. The boundary layer is defined as the viscous flow close to the hull of a ship. It is Stern's research in this field over the last four years that has intrigued the designers of the America's Cup yacht.

"Close to a moving ship, a layer develops that exhibits steep velocity gradients and rotating flow. Behind a ship, for instance, you can see all these swirls and eddies. Our main interest is how waves made by the ship affect that vortical flow."

Stern's research is funded by the Office of Naval Research and the Defense Advanced Research Projects Agency. Although some of his work is applied directly to ship design problems, much of it is directed toward how he and others will formulate and model future research problems.

"When we develop a technique for analysis useful to the navy or aerospace laboratories, they use that technique for design or analysis of design," Stern says.

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Iowa Wins Bid for National Driving Simulator

National Traffic Safety Board Makes Long-Awaited Choice

Scene 1: You are driving down a congested street at dusk. Just as you realize you’ve forgotten your driving glasses, a child darts out from between two cars, inches from your front bumper. Your heart pounds as you slam on the breaks, jerk the wheel—and hope.

Scene 2: Same scene, same action, but you are sitting behind the wheel of the world’s most advanced driving simulator, and the child is the figment of a computer’s imagination. Welcome to 1997 and the National Advanced Driving Simulator (NADS), a $32-million research center at the University’s Oakdale Research Park.

After months of tense anticipation, the National Highway Traffic Safety Administration announced in January that it would follow the National Science Foundation’s recommendation and award the sophisticated driving simulation center to The University of Iowa.

In fierce final competition with the University of Michigan, Iowa came out on top. When judged according to 19 criteria, Iowa won on all but two and was the unanimous choice of the nine NSF panelists.

“We beat the best,” says Edward Haug, Carver Distinguished Professor of Engineering and director of the Center for Computer-Aided Design. “That’s a good feeling.”

Once it is up and running, the center will house state-of-the-art simulation equipment and a staff of about 50 to conduct experiments for ground vehicle safety research and, if American car makers respond favorably, vehicle safety design. Researchers will use NADS’ sophisticated parallel computers to accurately simulate how wheels react to road surfaces—the sight, sound, and feel of actual driving.

“It’s a terrific way to understand the limits of driving safety by letting drivers get into trouble without doing any damage to them or their vehicles,” Haug says.

Simulated driving conditions will help highway engineers design safer roads, car manufacturers design better cars, and health and human science researchers answer fundamental questions about how drugs, physical impairments, and aging affect drivers.

Haug stresses the multidisciplinary nature of research at the new center. Currently, five co-principal investigators from engineering and psychology are working on the NADS project.

The new center will accommodate a number of research projects at once, and experiments may be linked between NADS and the University’s Iowa Driving Simulator (IDS), currently the most sophisticated device of its kind in the nation.

The IDS already has been a powerful tool in research. For example, Patricia Colsher, associate research scientist in preventive medicine at Iowa, has used the simulator to examine how older drivers adapt to age-associated impairments, such as reduced peripheral vision.

“Simulation provides a remarkable array of very detailed measurements that cannot be assessed on the road,” Colsher says. “And with the new NADS, we should be able to conduct even more physical capability tests, such as electroencephalographic monitoring.”

Haug describes the lengthy process of designing and building the NADS center as “an exercise in applied humility.”

“As mechanical and electrical engineers,” he says, “we will get the center built and working. But then specialists in many fields must use it for human response experiments. We’re creating the capability, but deep skills in the health and human sciences are required to use it.”

Pioneering Facility Paves Way for Concurrent Engineering

When The University of Iowa unveiled its Iowa Driving Simulator (IDS) in 1991, it not only led the field of driving simulation hardware, it also began to get more grants for research using the advanced equipment. The Center for Computer-Aided Design (CCAD), which houses the IDS, was recently awarded a two-year contract for one million dollars per
year from the Defense Advanced Research Projects Agency (DARPA) to develop concurrent engineering design methods for military tracked vehicles, using the driving simulator.

The grant will allow the CCAD to devise engineering tools that can be used to design and test military ground vehicles. According to Edward Haug, University of Iowa Carver Distinguished Professor of Engineering and director of the Center for Computer-Aided Design, the project also will ensure that the tools will be in a form useful to industry.

"Technology transfer is a key component," Haug says.

The DARPA project will exemplify the benefits of concurrent engineering, the collaboration of people from different disciplines, each of whom helps define a design as it evolves.

"Designers must take into account dynamic performance, structural performance, and the interaction between the operator and the machine," Haug says. "We try to design adaptability for human use, reliability, and minimum maintenance into the equipment itself."

Traditionally, designs are created without the full consideration of some of the relevant disciplines. Once expensive prototypes are built and tested, it's too late to make major design changes, Haug says.

"Using simulation in a concurrent engineering environment, you bring the human/machine interaction into the design process very early," he says. "Not only can you make design adjustments 'on the fly' as the design evolves, you can also test many designs. That's an absolutely revolutionary design capability."

Guest Says Ethics Are Vital for Engineers

"Engineers, keep to your convictions!" That straightforward advice was the message delivered by United States Air Force General Donald J. Kutyna during his guest lecture last September to Professor Ralph Stephens' mechanical systems design class.

As part of this class, Stephens focuses on ethics, products liability, and engineering product standards.

"I try to address not only the technical aspects of mechanical and systems failure," Stephens says, "but also the human element in failure—the political and social factors that engineers must consider in their work."

After hearing Kutyna talk in a space research seminar in 1989, Stephens invited him to return and talk to University of Iowa engineering students.

In his presentation to Stephens' students, Kutyna used the space shuttle Challenger disaster as a graphic example of how technological capabilities, politics, and personal ethics can affect professional decision making. He punctuated his talk with illustrations from his personal knowledge and involvement with the space program.

Kutyna is the commander-in-chief of the North American Aerospace Defense Command and the U.S. Space Command. He spent two years at The University of Iowa College of Engineering before entering West Point in the mid-1950s and later earned a master's degree in aeronautics and astronautics from MIT.

"General Kutyna's hero in the Challenger disaster is Roger Bosjoly, the engineer who insisted Challenger shouldn't be launched because the temperature was too cold," Stephens says. The four-star general's admiration for the "whistle-blowing" engineer developed when Kutyna served on the presidential commission that investigated the accident.

Kutyna's discussion of the Challenger debacle complements Stephens' use of other case studies in his class. According to Stephens, the Challenger affair is particularly effective at impressing upon students "the disastrous consequences that can occur when engineers are coerced by political or management pressures to change their professional opinions."

By examining the processes of real-life decision making, Stephens hopes to heighten his students' awareness of their ethical responsibilities. Stephens' own philosophy can be summed up as, "The best way to be less liable is to be more responsible."
Polluted Air, Acid Rain, and Environmental Disaster: Professor Traces Lignite Coal in Czechoslovakia

The most polluted air in the world has destroyed more than a quarter million acres of forest in northern Czechoslovakia and is damaging more than half of Czech forests, according to Jerald L. Schnoor, professor of civil and environmental engineering and co-director of the University’s Center for Global and Regional Environmental Research.

Schnoor began researching the causes and consequences of east European air pollution in 1981 and was a U.S. National Academy of Sciences Exchange Scholar to Czechoslovakia earlier this year. He spent last summer trying to assess and improve the air in Czechoslovakia, Hungary, and Switzerland, work that was featured as the cover story for the January 1992 issue of Environmental Science and Technology.

The major cause of the severe air pollution in Czechoslovakia is the use of lignite coal, Schnoor says. The soft coal is as high as 15 percent sulphur and 40 percent ash by weight; it produces concentrations of particulates and sulphur dioxide in the air up to 20 times the acceptable level in the United States.

"Most countries wouldn’t dream of burning this kind of coal today," Schnoor says. "In 1952, England suffered a high-sulphur dioxide ‘fog event’ that killed 4,000 people in four days—a tragedy that couldn’t happen there now."

"In Czechoslovakia, however, inexpensive, low-grade coal remains the primary fuel for both homes and industries," he says. "In essence, soft coal fuels the country’s economy, a dependence that has resulted in significant environmental damage as well as social and health costs."

Last winter, the 10,000 schoolchildren in one Czechoslovakian town had to wear face masks during recess. During past summer visits, Schnoor himself was unable to sleep without a wet towel over his face to help him breathe.

Schnoor suspects that the high-sulphur, high-particulate, high-acid-rain nature of the air also has created a legacy of poisoned soil that defeats reforestation efforts on thousands of acres of now-barren landscape.

"The best immediate hope for Czechoslovakia is conservation," he says. "That country wastes more fuel per capita than the United States—and we use 30 percent more than other developed countries."

Schnoor believes that a 43-year policy of inexpensive, subsidized fuel under industrializing communist governments now must be replaced by new regulations and market incentives to encourage fuel conservation—the first crucial step in cleaning the air.

As Czechoslovakia’s political structure has changed during the last five years, so have efforts to improve the country’s poor air quality. Schnoor notes that whereas the earlier communist government refused even to acknowledge the existence of pollution, the new government is encouraging Czech and international experts to help tackle the country’s serious economic, environmental, and health problems.

Study and recovery of Czechoslovakia’s environmental disasters will require years of effort. Schnoor recently submitted a proposal to the U.S. Environmental Protection Agency to establish a four-year, comparative ecological study program that would measure and monitor three damaged or endangered forest ecosystems and would establish indicators of ecological disturbance and recovery.

Schnoor also visited Budapest, Hungary, last summer to discuss with Mayor Gabor Dámszky the effectiveness and feasibility of using poplar wood “biobriquettes” for low-sulphur fuel. The concept is an outgrowth of research conducted by Schnoor and Louis A. Licht, research scientist in civil and environmental engineering, on the ability of poplar trees to effectively filter pollutants from water.

The trees not only absorb pollutants, according to Schnoor, but can be harvested, compressed into briquettes, and burned in fuel plants that are far less polluting and more efficient than the coal-burning home furnaces currently used in Hungary. A pilot project in Budapest should be up and running by next calendar year.

Schnoor’s third stop was Switzerland, whose regal forests, pristine air, and gleaming

“Most countries wouldn’t dream of burning this kind of coal today. In Czechoslovakia, however, inexpensive, low-grade coal remains the primary fuel for both homes and industries.” — Jerald Schnoor
white glaciers are threatened by human activity. Six million Swiss live in a country one-fourth the size of Iowa, surrounded by other densely populated and polluting European countries.

Increased particulates from automobiles, heavy metals in the water, acid rain, and forest decline have had significant effects on the Swiss environment.

"Violation of Switzerland's ozone standards occurs about 50 days of the year, and in recent years there has been a dramatic decline in visibility," Schnoor says.

Also, the country has lost some high-elevation forests, increasing the avalanche risk for mountain towns. In an effort to discover the causes of decline in Swiss forests, Schnoor and his colleagues are monitoring the concentrations of cadmium, zinc, and lead in several small mountain lakes.

"The lakes, which have higher concentrations of some toxic metals than Lake Erie, are like test tubes in nature," Schnoor says. "Monitoring them should help us better understand how much pollution is coming down in precipitation—pollution that damages trees as well as lakes."

This summer Schnoor will continue his work in Czechoslovakia and Switzerland and will travel to Russia as well. In May and June he will be in Rio de Janeiro, Brazil, for a United Nations conference on environment and development. There he will participate in a conference working group on legal and institutional issues. Schnoor says it is hoped that the 105 heads of state expected to attend the conference will sign a treaty on global carbon dioxide emissions.

Professors of Electrical, Civil Engineering Retire

Two College of Engineering professors retired from the University at the end of the spring semester.

Donald B. McDonald, professor of civil and environmental engineering, came to Iowa in 1973, after receiving B.S., M.S., and Ph.D. degrees from the University of Utah. An expert in toxicology, McDonald has taught courses on solid and hazardous wastes, environmental microbiology, and experiments in civil and environmental engineering.

McDonald has served as a consultant to numerous power companies, industries, and consulting engineering firms. In recent years, his research interests have focused on agricultural pollution and environmental toxicology.

Earl D. Eyman, professor of electrical and computer engineering, began teaching at the College of Engineering in 1966, after receiving his B.S. and master's degrees from the University of Illinois and his Ph.D. from the University of Colorado. Prior to his appointment at Iowa, Eyman worked for almost 20 years in industry, including 15 years as a research or project engineer with Caterpillar Tractor Co.

An expert in computers, gear stress, and fluids, Eyman has taught courses in statistics and electric circuits. His longtime membership in IEEE has included service on the rotating machinery committee. Eyman's many awards include recognition for his professional work as an engineer as well as four battle ribbons with three stars, earned during World War II.
Two Longtime Faculty Members Die

The College of Engineering recently lost two valued colleagues with the deaths of John F. Kennedy, Hunter Rouse Professor of Hydraulics and director emeritus of the Iowa Institute of Hydraulic Research, and Neil Fisher, assistant professor emeritus of civil and environmental engineering.

Kennedy, who died in December at age 57, served on the University faculty and was director of the hydraulics institute for 25 years. He was internationally recognized for his work on applied fluid mechanics and engineering hydraulics. He came to Iowa after earning a bachelor's degree from the University of Notre Dame and master's and doctoral degrees from the California Institute of Technology.

Recognition for his professional achievements included an honorary doctorate from the University of Notre Dame, appointment as The University of Iowa Carver Distinguished Professor in 1981, and appointment as the first Hunter Rouse Distinguished Professor in 1987.

In 1973 Kennedy was elected to the National Academy of Engineering, the highest professional honor that can be conferred on an American engineer. He was awarded the Hilgard Hydraulics Prize from the American Society of Civil Engineers in 1978 and was named outstanding engineer of the past 25 years by the Iowa Engineering Society in 1989.

Kennedy served as an adviser to the Nuclear Regulatory Commission, the National Research Council, and the National Academy of Science. From 1980 to 1984, he was president of the International Association for Hydraulic Research, and in 1986 he was named a corresponding member of the Chinese Hydraulic Engineering Society.

Kennedy wrote more than 50 journal articles and wrote or edited three books. He shared three patents for his work.

He is survived by his wife, two daughters, two sons, and a sister. Memorial donations may be made to the University of Iowa Foundation in care of the Dr. John F. Kennedy College of Engineering Fund.

Fisher died in October at age 70. He taught at the University for 31 years, retiring in 1985. At various times he also acted as the supervisor of the University's Water Plant and as a sanitary engineering consultant. He served in the Air Corps during World War II and later earned both his bachelor's and master's degrees from The University of Iowa.

Fisher was active in many professional organizations, including the American Water Works Association, the Water Pollution Control Federation, Chi Epsilon, and Sigma Xi. In 1976 he received the Fuller Award and the Iowa Section Meritorious Award from the AWWA.

Fisher is survived by his wife, three brothers, and two sisters. Memorial donations may be made to the Neil B. Fisher Environmental Engineering Fellowship Fund, in care of the University of Iowa Foundation.

Alumnus Establishes Trust To Provide Scholarships for Outstanding Students

At an alumni reception held in Dallas in the fall of 1990, Dean Robert Hering and the College of Engineering received some good news: Philip Temple (B.S.M.E., '50) asked the dean if the college would be interested in helping him establish a charitable trust to provide scholarship support for future University of Iowa engineering students.

"My wife and I have very fond memories of The University of Iowa," says Temple, a retired vice president for engineering with Corry Hiebert Corporation, a division of HON Industries. "I believe that the future of the United States will be strongly influenced by engineers. I'm proud of what the College of Engineering has done and continues to do, and I want to help future engineers contribute to the good of the school, the country, and the world."

Temple's gift is among the largest outright contributions ever made to the college, according to Rich Wretman, University of Iowa Foundation director of development for the College of Engineering. As a trust, the scholarship fund is a hybrid of gift-giving approaches. Temple will continue to receive interest on the principal during his lifetime. At the time of his death, the principal will endow the Phil Temple Scholarships, providing support for academically outstanding engineering students for many years to come.
Search Is On for New Dean Who Can Fill a Tall Order: 
Maintain Impressive Growth in Time of Stress, Change

The retirement of Robert Hering as dean of the College of Engineering has triggered a search for a new dean who can confront the challenges that will face the college during the next decade and beyond.

“We are building from strength,” says Forrest Holly, chair of the dean search committee, “and one of our goals in selecting a new dean is to continue the momentum established by Bob during his many active years as dean.”

Holly, professor of civil and environmental engineering and a research engineer at the Iowa Institute of Hydraulic Research, heads a ten-person committee of engineering faculty members, one college staff member, and two University faculty members from outside the college. The committee began work early last fall, when it advertised the position in national publications and mailed thousands of letters not only to other colleges of engineering but also to engineering college friends, alumni, and past and present members of The University of Iowa Engineering Advisory Board.

From more than 70 applications, seven candidates were selected for a first visit. Three to five candidates will be chosen to return for a second visit, and one of them will be chosen to be the new dean.

According to Holly, the search committee has developed a broad list of capabilities and qualifications that the new dean should have, based on suggestions from engineering department heads, institute and shop directors, alumni, and faculty members.

“The College of Engineering is in great shape today,” Holly says. “Dean Hering’s tenure has been one of impressive growth, and we want to maintain that momentum.”

Holly adds that future deans will be confronted with unique institutional, economic, and personnel demands.

“The next dean must be able to maintain strong relationships with all of our constituencies, including alumni and industry,” Holly says. “The College of Engineering wants to improve undergraduate education, as outlined in the University’s strategic plan, while continuing its strong record of research, teaching, and service. And we sorely need more space.”

Holly stresses that the new dean must be able to guide the college through the stress and transformation that engineering schools across the country are experiencing.

“Engineering colleges today are competing for increasingly scarce resources,” he says. “At the same time, engineering education is changing significantly.

“For instance, many of the tasks that used to be performed by engineers are now being done by computers, so to some extent, we all must become computer scientists.”

Although several other engineering colleges also are looking for new deans, Holly hopes that a well-qualified candidate will be selected before July 1.

Grads Gather for Ball Game, College Get-Together

College of Engineering alumni attending last January’s Holiday Bowl football game in San Diego had an opportunity to celebrate at a college reception hosted by Dean Robert Hering at the San Diego Marriott Hotel and Marina.

“It was a great opportunity for alumni who live in that area or who were attending the game to come together, get reacquainted, and pay their regards to Dean Hering,” according to Associate Dean Paul Scholz.

The West Coast event attracted more than 50 people. Alumni from the classes of 1930 to 1985 and from locations as far spread as Hawaii and Illinois were there.

Besides providing an opportunity to meet the dean, visit, and exchange stories, the regional receptions give alumni a chance to learn about the growth and future of the College of Engineering.

“People really enjoy themselves at the receptions,” says Rich Wretman, University of Iowa Foundation director of development for the College of Engineering. “A number of people unexpectedly ran into friends and classmates, and I think everyone had an enjoyable evening.”
Intern Hones Skills with Machining Project That Will Benefit Manufacturing, Education

Cutting edge research is no cliché to Matt Lane. Lane, who earned a B.S. degree with honors in industrial engineering last December, developed a process to measure the forces generated during the machining process as parts are manufactured on a lathe.

The project, completed during Lane’s last semester as an undergraduate, has benefits for the classroom as well as for manufacturing and industry, says Gary Fischer, associate professor of industrial engineering and Lane’s mentor.

“With this process, we can offer industry some serious machinability studies and help them to understand machining problems,” Fischer says.

“A company may be looking at the material they use to make a specific part. Normally we think of strength, fatigue life, and other mechanical properties associated with the performance of the part as being the most crucial,” Fischer says. “But increasingly, companies are interested in other factors, such as keeping their costs down. They’ve got to be able to meet schedules, to predict how long it will take to make the part.

“With this kind of testing, we can investigate tooling alternatives and material characteristics to determine their impact on manufacturing,” he says. “We can run the same set of experiments with different combinations of materials and tools to understand how the machinability of each material compares.”

The machining project was a process waiting for someone like Lane to develop it, Fischer says. It required skills in the mechanical and electrical areas as well as in computer software and hardware.

“We’ve been wanting to do this for a number of years, and we just haven’t had the right kind of student—someone with the interest, ability, diligence, creativity, insight, everything required to make the thing work—because it’s a pioneering effort,” Fischer says.

“What Matt did had never been done at this university or in the state before, as far as I know,” Fischer says. “In fact, only a few research universities have this capability.”

Lane began the project by learning how a dynamometer (a device to convert cutting forces into measurable voltage signals) worked. Then he had to design an adaptor and mount the dynamometer on the lathe so that the separate pieces of equipment would work together, something they were not designed to do, Fischer explains.

Finally, Lane developed a computer program to receive information from the dynamometer and translate it into a form that could be displayed, compiled, and analyzed.

“I think more attention is being given to manufacturing planning today than in the past,” Fischer says. “People don’t want to run into problems once they get into production. They want answers about the right tooling and how much time it’s going to take. I think we can give them those kinds of answers.

“We’re trying to develop a capability that we can offer to industrial companies.

“And it comes back the other way—from those studies we get information that we can use in the classroom, information that gives us a better understanding of problems that arise in the workplace,” Fischer says.

The excitement of hands-on learning is exactly the opportunity Fischer wants to offer in his courses, including manufacturing processes, a survey of engineering techniques students will find if they work for a manufacturing company after graduation.

“Students learn about machinability in class and through homework problems, but we can add an extra dimension by letting them see the cutting process in the laboratory,” Fischer says.

Lane developed the project during a pre-teaching internship, which Fischer says is
designed to encourage promising students to continue their studies and enter the teaching and research professions. The work also provided the material for Lane’s senior honors work.

“The project really made me excited about getting involved in research applications,” Lane says. “It gave me the opportunity to learn a lot of things that you hear about and understand when you’re in class, but to actually make it work with your own hands is a learning experience that is unbelievable.

“I’d been involved with projects like this before. I spent four years as an Undergraduate Scholar Assistant, working with another faculty member, but I’d never had the chance to work on a project as exciting as this,” Lane says. “In fact, it changed my plans for the future.”

Fischer says he was impressed by Lane’s initiative in the face of challenging problems.

“Matt would come in here two or three times a week and say, ‘I’ve got to tell you what happened.’ He was so excited about what he’d learned. Sometimes, I’d find a note on my door saying, ‘We need to talk,’ and I’d know that he’d reached an especially difficult stage,” Fischer says.

For faculty, the rewards of such collaboration can be immediate and personal.

“I really enjoy working with students who are motivated, who are discovering new things. It’s fun to be a part of the energy that comes from that process,” Fischer says. “Students bring fresh insight to problems in many cases, and they challenge you to think in a way that you haven’t considered and offer solutions that you haven’t thought about.”

“Although Lane is now working at the Rock Island Arsenal, helping to get a CAD-CAM project into operation and acquainting the staff there with the equipment, the position is only temporary. By fall, he expects to be back at the University, working on an M.S. degree in industrial engineering and an M.B.A. under a Graduate College Fellowship. Lane’s decision to enter graduate school, with the eventual goal of earning a Ph.D., means that the pre-teaching internship has been a success, Fischer says.

by Kay Brown

What’s New with You?

Help us keep up-to-date on what’s new with you. Use this form to tell us about your current career status and professional activities.

☐ Please send information on how I can help Iowa engineering students through the UI Alumni Association Career Information Network.

☐ Please send information about the Engineering Development Fund.

Name ________________________________

UI degree(s) and years __________________
Hold the Sauce  Adriana Platt, from Ames, and Dan Moritz, from Council Bluffs, both electrical and computer engineering sophomores, put the finishing touches on their spaghetti bridge, which won first prize in a contest during the College of Engineering's celebration of National Engineering Week. Sponsored by Theta Tau, the contest challenged the budding engineers to build a cantilever of four feet or more with a one-pound package of spaghetti and a roll of transparent tape. The teams had 30 minutes to complete the task; the finished bridges were allowed a droop of up to six inches from one end to the other, and there was no allowance for excess humidity. For their winning effort, Platt and Moritz split a $25 prize and had their pictures published in The Des Moines Register and The Daily Iowan. Moritz said the contest reminded him of the Lincoln Logs he played with as a child. "We didn't have fancy toys, but we could make just about anything with those logs," he said.