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Industrial and Manufacturing Systems Engineering

IMSE news

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DESPITE NEAR-DEATH, INDUSTRIAL ENGINEERING DEPARTMENT THRIVING

REGENTS ALMOST AXED IMSE, NOW IT'S AMONG BEST

Printed September 17, 1992

by Jennifer Dukes
Daily Staff Writer

An engineering department that nearly died at the hands of the state Board of Regents now boasts of nationwide recognition.

More than three years after the regents' ax threatened to fall on the Department of Industrial and Manufacturing Systems Engineering (IMSE), it is ranked among the best schools in the nation, said Way Kuo, IMSE chairman.

In February 1989, Iowa State's Long Range Planning Committee report recommended that the department - then called the Industrial Engineering department - be eliminated. The Peat Marwick study, instigated by the regents, examined ways to make ISU more efficient and also recommended elimination, based on the types of courses offered in the department.

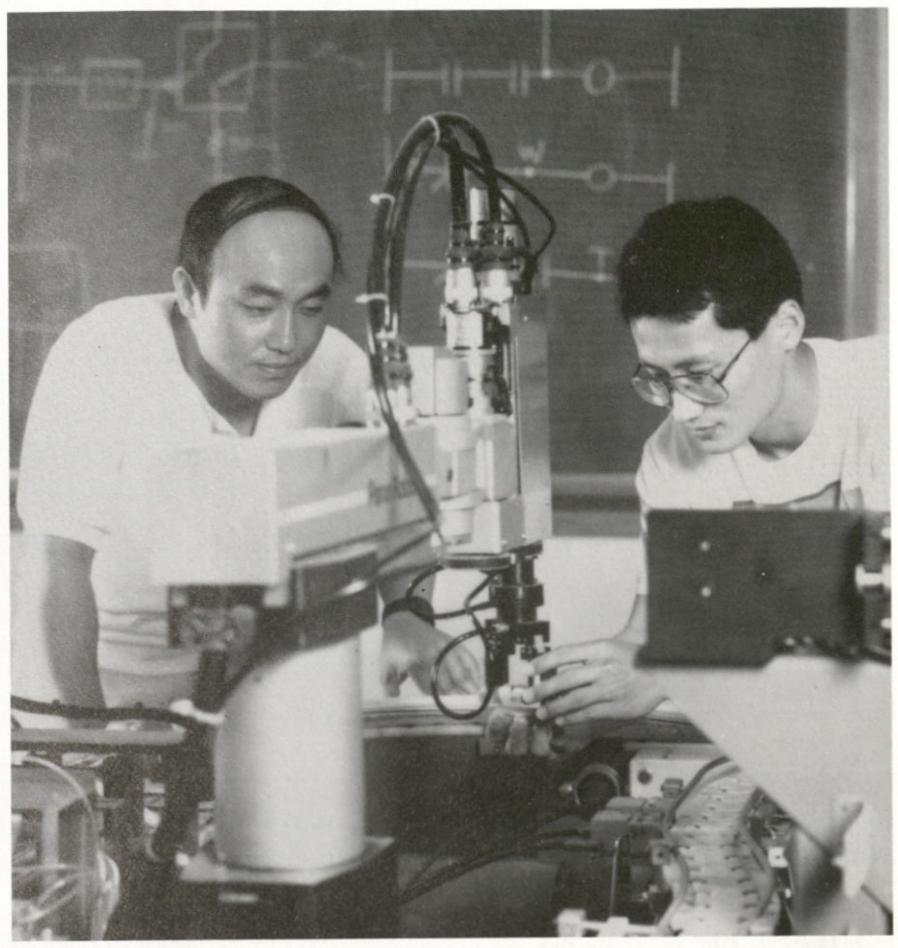
Kuo said the department could have been eliminated but Engineering Dean David Kao pleaded with the regents to spare the program. IMSE was one of few survivors. "We were an exceptional case," Kuo said. "But we tried extremely hard." A new focus was the savior.

Kuo said the department molded the program to fit the nation's increasing manufacturing demands. Prior to the change, the department had been more business-oriented.

"The regents finally said 'OK, we'll give you a chance,'" Kuo said, "Actually, I think we are very lucky."

The undergraduate and graduate courses have undergone major restructuring since then, he said. About 50 percent of the classes have been revised or restructured.

Of the 18 faculty members in IMSE, eight to 10 are new. Many



departing instructors retired, he added.

In the eyes of engineering professionals nationwide, the changes seemed to work.

The Gorman report ranks ISU's department in the top 10, and the National Science Foundation also considers it one of the best.

Geraldine Montag, IMSE Professor, said the graduate program recently received funding from a $300,000 proposal submitted to the U.S. Department of Education. The program will provide stipends for six full-time study fellowships, tuition, books and foreign travel.

Kuo said the department's success has allowed it to tap into some important research funding. In 1991, IMSE received more than $3 million, one of the highest amounts among industrial engineering departments across the country.

Graduate student Kraig Downs lauds the ISU Department. "The IMSE faculty have very diverse backgrounds providing many differ-

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THANK YOU FOR YOUR SUPPORT

The IMSE Department recognizes the following alumni and friends for their gifts to the department during 1992. Contributors supported IMSE's new focus on manufacturing, responded to items they read in IMSE News, or gave as part of ISU's Partnership for Prominence capital campaign.

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IMSE HELPING U.S. STAY COMPETITIVE IN MANUFACTURING FIELDS

By Michele Mihalovich

Five U.S. students have been selected to participate in ISU's first Manufacturing Fellows Program in concurrent engineering design.

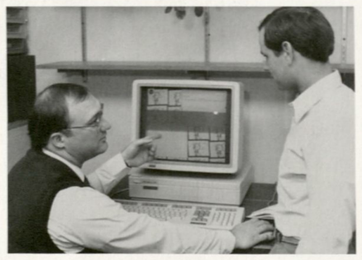
Department Chair Way Kuo felt the program was necessary because most engineering graduate programs have a shortage of U.S. citizens. "This deficiency will hinder the United States' ability to be successful in today's advanced manufacturing environments," says Kuo.

It was proposed to the Federal Department of Education that ISU implement a manufacturing fellows program to help attract quality students to develop their teaching and research expertise in manufacturing.

The IMSE Department received more than $300,000 from the Department of Education and $225,000 from ISU to implement this project. The following students are currently participating in the program.

Peter Brust received his B.S. and M.S. degrees from Lehigh University in Bethlehem, Pennsylvania. He has participated in co-ops with AMP Inc.'s Manufacturing Technology Center, U.P.S., and Lehigh's Computer Integrated Manufacturing Lab. Brust is interested in manufacturing processes and automation.

Robert McCoy received his B.S. degree from the University of Idaho, an M.B.A. from Virginia Tech, and an M.S. degree from the University of Arizona. McCoy has worked for the Phelps Dodge Corporation in Arizona and Martin Marietta Aerospace in Denver. He is interested in Material Requirements Planning Systems and is working with Dr. Doug Gemmill and Dr. John Jackman. His wife is currently working on her Ph.D. in electrical engineering at ISU.



Manufacturing Fellows McCoy, Brust (seated), Singleton, Rupe, and Moon

Michael Moon received his B.S. and M.S. degrees from the University of Iowa and was an instructor at the Gustavus Adolphus College in Minnesota. Moon is interested in statistics and stochastic processes.

Jason Rupe received his B.S. and M.S. degrees from ISU. He was a shelter survey technician for FEMA (Federal Emergency Management Agency). Rupe is interested in reliability and communication networks in manufacturing environments and is working with Dr. Kuo.

Scott Singleton received his B.S. and M.S. degrees from Wichita State University then worked at Boeing in Wichita for more than 10 years. Singleton is interested in mathematical modeling of various manufacturing production systems.

Each student receives an annual fellowship grant of $16,000 which includes tuition, textbooks, and travel. Students excelling in their studies will visit various institutes and industries in foreign countries. Jason Rupe traveled to several manufacturing companies in Portugal last summer as part of the program.

"Travel to foreign countries enables the students to learn how manufacturing is practiced outside the U.S.," Kuo says. "We want these students to become professors, so they must be familiar with both academic and industrial problems."

"The program could not be progressing better," says Kuo. He does, however, hope to search out funds from industries, the National Science Foundation, and the Department of Defense in order to make the program a permanent fixture at ISU.

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ent points of view on coursework material," Downs said.

Junior Kristy Devlin said, "The instructors I've had so far have been really helpful and good at getting us into the real world. I feel very confident about the things I've learned."

Senior Craig Vander Leest said the shifted focus in the department is beneficial for students pursuing careers in manufacturing and technology. "But, for students interested in management, it hurts those people a little bit." Vander Leest said, adding that the business courses formerly offered initially drew him to the department. "In the long run, though, for most people, it's going to help because they are getting a technical background," he said.

OUTSTANDING INDUSTRIAL ENGINEERING DESIGN AWARD

During fall semester, 1992, teams of students in the senior capstone design course competed to design a solution to a problem posed by Motorola, Inc. Their problem was to improve the design of assembly lines that were being moved to Motorola's Arlington Heights, Illinois, facility. IE grad Mary (Johnson) Hassler (BSIE 1985) helped arrange the partnership and was also one of the judges. Designs were evaluated on originality, feasibility, thoroughness, and written and oral presentation.

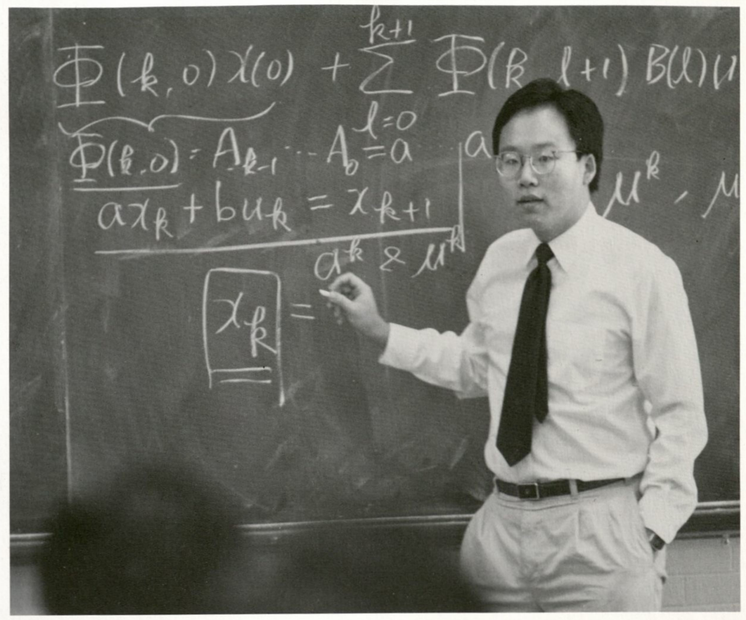
The winning team (shown here left to right) of Iowans John Duren (Osage), Steve DeFord (Cedar Rapids), and Kenny Wickman (Rodman) developed a design judged to be of excellent quality and highly workable. Judges cited the team for their attention to details and the number of factors they considered. The team received an award of $400 from Motorola, and their names were added to a placque displayed in the IMSE Department.

The IMSE Department and Motorola congratulate these students on their excellent design effort.

UNDERGRADUATE RESEARCH WITH JO MIN

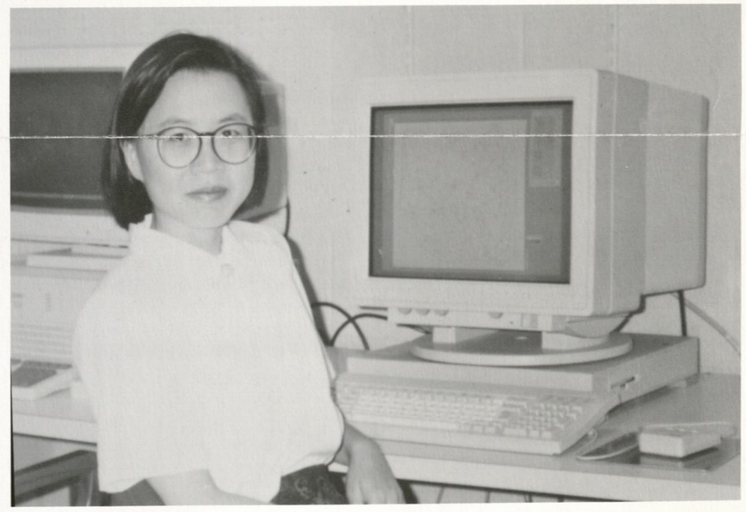
Since December 1991, a few undergraduate students in the Department of IMSE have been investigating critical components of production systems such as inventory and allocation policies under Dr. K. Jo Min's supervision. These students have been supported by a Research Experiences for Undergraduates (REU) grant from the National Science Foundation and an undergraduate fellowship from the Iowa Center for Emerging Manufacturing Technology.

Wallace Chow (IE, Senior) has been working on the design and analysis of efficient allocation mechanisms for semiconductor products and the development of software for allocation policies. Jennifer Leng (BSIE, December 1992) and Karen Johnson (IE, Senior) have been working on the conceptual modeling of competitive inventory and pricing policies. Their findings, thus far, are summarized in three technical reports. In November 1992 an additional undergraduate fellowship was awarded to further investigate the issues of inventory and pricing policies.



GRADUATE RESEARCH WITH LIN-LIN CHEN

One on-going research project in the IMSE Department aims at building a virtual environment model of a computer-integrated manufacturing workcell. "A Virtual Environment for Manufacturing Systems" funded by the Office of Naval Research for $722,238 for a period of three years from 1992 to 1995, is a joint project that involves Dr. James Oliver and Dr. Martin Vanderploeg from the Department of Mechanical Engineering, Dr. Lin-Lin Chen from the IMSE Department, and the Iowa Center for Emerging Manufacturing Technology. Under this research grant, Dr. Chen and three IMSE graduate students, Ming-En Wang, Swaminathan Rajagopalan, and Shiang-Fong Chen, have been working on the design and implementation of visualization tools for generating and verifying assembly plans. During the last three months, the research focus has been the development and implementation of algorithms for proposing disassembly trajectories. Ming-En Wang has been working on the development of a new set of algorithms for generating potential assembly/disassembly directions for components with freeform surfaces. Swaminathan Rajagopalan has been working on the development of an interactive tool for visualizing a Bezier surface and its corresponding Gaussian Map formed by translating the unit surface normals at the points on the surface to the origin. Concurrently, Shiang-Fong Chen has implemented an algorithm for generating an assembly/disassembly plan of a two-dimensional assembly. The goal of these research efforts is to build an interactive assembly planning tool that takes as input the given set of parts in their final positions in the assembly, allows the user to select a part or a subassembly from the screen, assists the user in specifying a feasible trajectory for removing the part or subassembly, and, if no feasible disassembly trajectory can be found, assists the user in determining a trajectory that minimizes the collision volume.



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We want to hear about your career moves and personal news for our alumni news page. We need your help, too, with donations to scholarship funds, lab facilities, and student groups. If you're making a contribution to your alma mater, please consider designating it for the Department of Industrial and Manufacturing Systems Engineering. The form below will make it easy for you.

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- ❑ *New laboratories development fund*
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A · L · U · M · S

1980 B.S. and 1992 M.S.
Debra Bishop was awarded the AT&T Bell Laboratories Doctoral Fellowship to begin working on her Ph.D. at Iowa State University Fall Semester, 1992.

1984
David P. Skarshaug has joined Skarshaug Testing Laboratory Inc. of Ames as vice president. Skarshaug is a registered professional engineer in California and was an industrial engineer with Puritan-Bennett FOxS Division in Carlsbad, California. Other companies Mr. Skarshaug worked for in California are General Dynamics, Plessey Electronic Systems, and Litton Automated Systems.

1988
Patti Rogers, Industrial Engineer, Carlon, a Lamson and Sessions Co., Clinton, Iowa.

1990
Adina Green Hatch, Systems Engineering, Harvard Community Health Plan, Brookline, Massachusetts.

1991
Lisa Koltveit, Industrial Engineer for 3M Disposable Products Division in the Chicago area.

THE IMSE DOCTORAL PROGRAM

The IMSE department now has one of the highest admission standards for doctoral students among peer departments across the nation. A national survey ranked the IMSE department requiring, among other criteria, the highest cutoff on General Record Exam (GRE) analytical score. The GRE is a universal graduate entrance exam used by most universities.

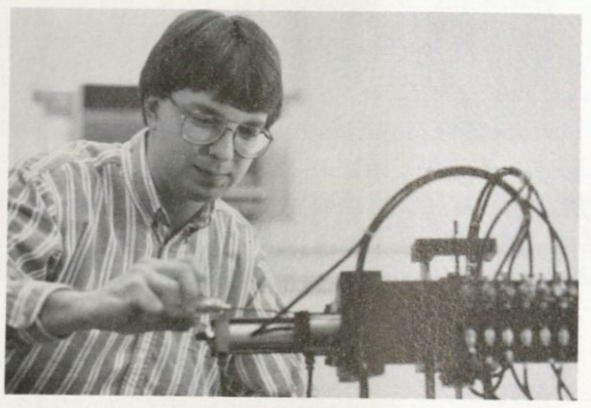
The quality of the doctoral program is evidenced by the funding of a $300,000 proposal by the U.S. Department of Education for "Manufacturing Fellows Program in Concurrent Engineering Design." The program is currently providing stipends for five graduate students (see story, p. 2).

IMSE HIRES A LAB TECHNICIAN

by Michele Mihalovich

The IMSE department added a new member to its family last October when it hired former ISU student, Michael D. Renze, as the IMSE lab technician.

Assistant Professor Richard Linn said, "Technology has changed so much. The new equipment and computers that need to be implemented and repaired in the new IMSE labs made it necessary for a full-time lab technician."



Renze received his B.S. degree in computer engineering at ISU and was working on his M.S. degree when he was hired by the university. He also worked part time with RTAG (Research Technical Assistance Group), now part of ERI's technical services.

Renze is responsible for all eight IMSE Labs, including the Industrial Design, Work Analysis and Ergonomics, Large-Scale Systems, Manufacturing Processes, Manufacturing Systems, CAD/CAM, Materials Handling, and Quality Reliability labs.

Renze will develop computer-based instrumentation; maintain the department operating system; consult with faculty about purchasing and updating software and equipment; install new equipment and software; and serve as a troubleshooter when problems arise.

Renze is also responsible for monitoring inventory; instructing faculty, students, and staff on the proper use and care of equipment; and maintaining the IMSE security system.

In order to stay on top of the increasing technological changes, Renze will attend at least two seminars or workshops each year.

Before Renze was hired, professors were responsible for getting equipment and software back on track. "It was getting to be very overwhelming," said Richard Linn. IMSE is pleased to welcome Renze aboard.

IMSE

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