ARIZONA Civil View®
College of Engineering and Mines

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Eyes in the sky

Satellites, aircraft may tell us a lot about traffic

Transportation departments have two primary goals for urban traffic systems — to operate them as efficiently as possible and to make the best decisions on how to improve them.

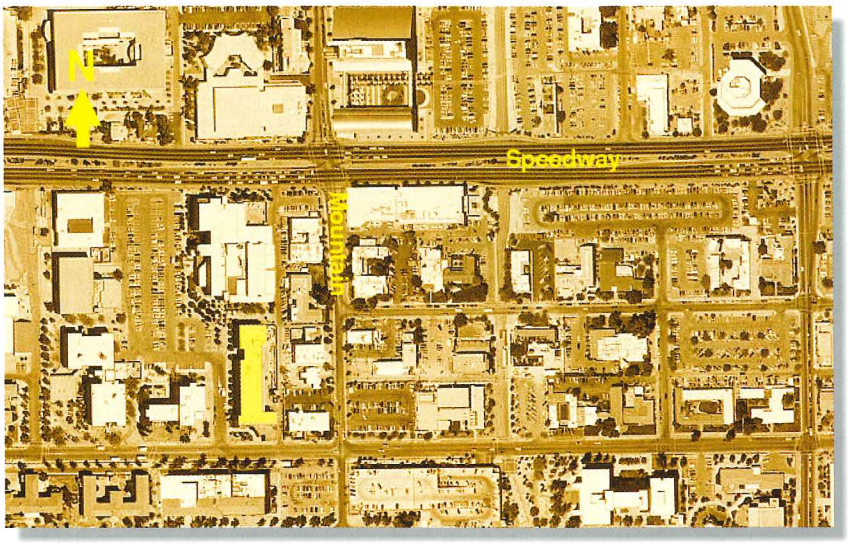
To meet these goals, they have to use the best information available.

Assistant Professor Mark Hickman thinks better data may come from cameras mounted on satellites, tethered ballons, helicopters and airplanes.

He is exploring the feasibility and cost effectiveness of collecting aerial imagery for analysis of traffic flows under a 4-year, $3 million project funded by the U.S. Department of Transportation.

Professor Pitu Mirchandani, of UA Systems and Industrial Engineering, is the principal investigator on the project, which also involves researchers from Ohio State and George Mason Universities. Professor Robert Schowengerdt of UA Electrical and Computer Engineering also is involved.

Photo courtesy of Mark Hickman



CEEM Assistant Professor Mark Hickman is testing the feasibility of using aerial photography and satellite monitoring to gather information for roadway construction planning, signal timing and traffic system operations. This aerial photograph shows part of the University of Arizona campus. The Civil Engineering Building is highlighted in yellow.

Currently, traffic flow data is gathered through electronic loops in the pavement or by field workers who videotape traffic flows or take manual counts on site.

Both approaches have problems. Pavement loops break down and require considerable maintenance. Sending workers to gather data on site is expensive. In addition, these techniques are locally focused and don't provide a full picture of current traffic flows.

Aerial cameras, however, could

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Haldar wins teaching award

Professor Achintya Haldar has won the 1999 Burlington North Foundation Faculty Achievement Award for excellence in teaching.

The award recognizes a faculty member's efforts to provide quality learning experiences for students and his scholarly contributions, including research and publications, that have advanced and enhanced teaching.

"Professor Haldar's devotion to his students is simply outstanding," says CEEM Department Head Juan Valdés.

Comments from Haldar's students echo Valdés' praise:

"By the end of my sophomore year, I had lost interest and motivation for civil engineering entirely,"

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7 ASCE student chapter hosted 2000 Pacific Southwest Conference in April for 500 students, 17 schools.

By Juan Valdés


University Photo Center

Highlights from an exciting year

From ABET accreditation and ASCE conference to new faculty and scholarship endowments, the department continues to excel

This has been an exciting year for the department. Here are some highlights:

• Last July we received confirmation that the department obtained full accreditation of its Civil Engineering undergraduate program from the Accreditation Board for Engineering and Technology (ABET).

• This spring we completed the university-mandated Academic Program Review (APR) for the entire department.

• The students of the Society of Civil Engineers (SCE) hosted the ASCE Pacific Southwest Regional Conference in April, with 17 universities participating (see page 7).

• Following the ABET visit, the faculty — with input from alumni, employers and students — developed a new undergraduate curriculum . Parts of this new curriculum will begin this fall and the entire program will be fully implemented in the fall of 2001.

• Freshmen enrollment jumped 16% last fall, for the first time in several years.

We expect another increase in freshmen enrollment this year, and all accepted students will be contacted by SCE officers and members in an effort to help us retain as many as possible of those who have committed to UA CEEM.

• One way to recruit and retain the best students is by offering undergraduate scholarships. This year the family and friends of the late Paul G. Osborn, CE '67, established an endowed scholarship in his honor (see page 4).

The Newlin Scholarship also received contributions this year. Your gifts to these and other departmental scholarship funds greatly enhance our ability to attract and retain outstanding students.

• The department welcomed three new faculty members this year. Scott Merry (UA CE '91), and Mark Hickman have already joined our department. Robert Fleischman will be joining us this fall. (See page 7.)

• Meanwhile, Professors Simon Ince and Ed Nowatzki retired (see page 8) and Professor Panos Kiousis resigned to take another position. The department will miss them all. Ince is still with the department as an adjunct faculty member, and we expect Nowatzki also will take an adjunct post.

• Our faculty published three textbooks this year.

• Professor Achintya Haldar has been honored with the Burlington Teaching Award, a highly competitive university-wide award (see page 1).

• As always, we love to hear from our alumni. Three members of the Class of 1950 attended the graduation ceremonies this May — Rudy Jimenez, Delbert Lewis, and Jim Tolley. You can read more about Del Lewis on the following page in the Alumni Echoes section.

We enjoy your visits and hearing about your accomplishments. Keep in touch!

Pledges: Thank you for contributing to UA CEEM

Name _____

Address _____

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Enclosed is my tax-deductible donation for the Civil Engineering and Engineering Mechanics Fund. My check, payable to the **U of A Foundation**, is attached.

☐ There are often significant tax advantages to giving to the university through estate planning. Please send me information on this subject.

☐ I may be interested in endowing a fellowship or projects.

☐ My company will match my gift. The official company form is attached.

Please mail this form to:
Business Office
Civil Engineering and Engineering Mechanics
The University of Arizona
P.O. 210072
Tucson, AZ 85721

Or call: Department Head Juan Valdés at 520-621-6564.

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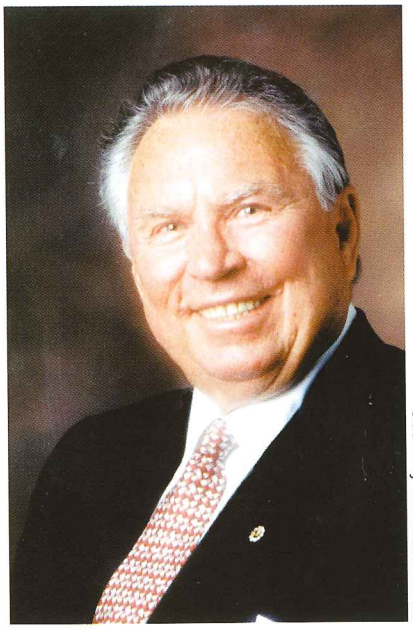
The *Arizona Civil View* informs friends of the University of Arizona Civil Engineering and Engineering Mechanics Department about research, student activities and other CEEM news. Its purpose is to foster communication between alumni, faculty, students and friends of the department.

Editor/Writer: Ed Stiles

Alumni Profiles

Delbert Lewis maintains his roots

He's now devoting full time to farming after retiring as CEO of media corporation



Courtesy of Delbert Lewis

Delbert Lewis, CE '50, retired as president and general manager of KTVK-TV3 in Phoenix and went back to his roots — farming in Florence, Arizona, about 50 miles north of Tucson.

He raises cotton, wheat, alfalfa and barley on 4,000 acres, considerably more than the 320 acres he started with in 1952.

Lewis went to UA in the "veteran years," after serving from 1944 to 1946 with the U.S. Navy in the South Pacific during World War II.

After graduation, he married Jewell McFarland and they lived in Virginia, where Del supervised a drafting team for the Army Corps of Engineers.

In 1952 he and Jewell moved back to Florence, where they began managing the farms owned by her father, Senate Majority Leader Ernest "Mac" McFarland.

After Mac lost his seat in a surprise upset to Barry Goldwater, he decided to get involved in the infant television business and asked Del to join him. They formed a group and were awarded a license. The station went on the air in Phoenix in 1955, and the rest, as they say, is history.

Eventually, Del became head of MAC America Communications, named in honor of Mac McFarland. In addition to KTVK, the company owned KESZ FM, KOAZ FM, PHOENIX Magazine, Video in Phoenix, and Desert Production Center.

Del and Jewell have served on many boards and civic groups. Their commitment to community service was recognized by United Cerebral Palsy in 1996, and they received the Institute of Human Relations Award from the American Jewish Committee in 1993. In 1997 the Arizona Historical Society named them "Historymakers" of Arizona. They co-chaired the capital campaign drive for the restoration of the Orpheum theatre in Phoenix, which re-opened in 1997, with the auditorium renamed the "Lewis Auditorium," in honor of Del and Jewell and their family.

And for the nearly 50 years they have served as Arizona business and civic leaders, they continued farming. "I've just worn two hats for the past 50 years," Del says.

Jeremy Mohr: master's student at NASA Langley

Jeremy Mohr, CE '98, has had an exciting two years since leaving UA CEEM.

After graduation, he headed East to do graduate work at the NASA Langley Research Center in Hampton, Va.

Courtesy of Jeremy Mohr

Mohr has been in George Washington University's self-sufficient graduate program located at Langley. It's called the Joint Institute for Advancement of Flight Sciences (JIAFS) and has only about 35 to 45 graduate students.

Each student is assigned to a branch on an assistantship program and has a NASA advisor to guide him through his research.

Mohr works in the Analytical and Computational Methods Branch (ACMB) as a graduate research student. During the past two years his research has focused on finite elements. He is just finishing his thesis, *An Efficient Triangular Shell Finite element for Thick Composites and Sandwich Laminates.*

"It may be pretty obvious that I found my background in the finite element method that I learned at UA to be a useful resource in my work here, " he says. "Also noteworthy was my background in FORTRAN, which I also learned at Arizona."

Mohr says the skills he learned through his involvement in student activities, such as SCE, has been just as important to his work as the classes he took.

After he finishes his master's degree, Mohr has a job waiting at a contracting company in Phoenix.

"I'm looking forward to being back out in the West," he says.

Scholarships

New scholarship honors '67 grad Paul G. Osborn

Family, friends and colleagues of Paul G. Osborn, CE '67, have established the Paul G. Osborn memorial Scholarship in Civil Engineering to honor his memory.

Osborn died in a motorcycle accident on August 7, 1999.

Osborn was a Registered Professional Engineer and Registered Land Surveyor in Arizona.

The scholarship will go to undergraduate juniors and seniors who are Arizona high school graduates enrolled in UA civil engineering. They must demonstrate financial need and show an interest in working in private land development.

Osborn served as an officer and member of the board of directors for OPW & Assoc., Inc. for 22 years.

OPW is a Tucson-based civil engineering involved in planning, engineering and surveying.

OPW projects have included Ventana Canyon and La Paloma Resorts and Golf Courses and surrounding residential projects. Current projects include Dove Mountain and Heritage Highlands Golf Courses and residential developments. The firm concentrates on private development work throughout Eastern Pima County.

Before becoming a founding partner of OPW, Osborn was engineering manager of the subdivision and floodplain section of the Pima County Highway Department.

Prior to that, he was a project engineer for Cella, Barr, Evans and Assoc. of Tucson, which works on subdivision design, utility and sewer design, hydrology and floodplain studies, land use planning, surveying, sanitary engineering and highway engineering.

Osborn was a past member of the board of directors of the Southern Arizona Home Builders Assoc. and, at the time of his death, a member of the National Association of Professional Engineers, Arizona Society of Professional Engineers, American Society of Civil Engineers, Arizona Consulting Engineers Assoc., Southern Arizona Home Builders Assoc., Tucson Utility Contractor's Assoc., U.S. Chamber of Commerce, Marana Chamber of Commerce, and National Federation of Independent Business.

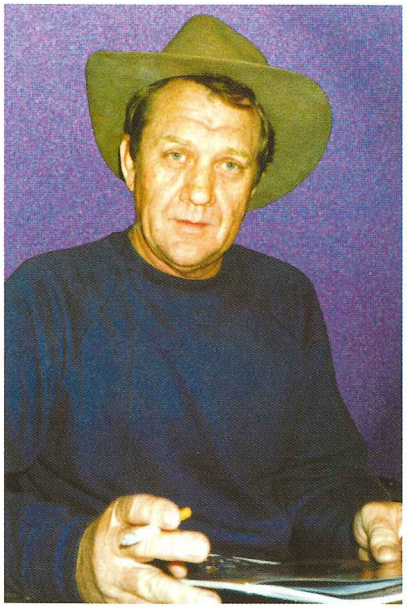


Photo courtesy of OPW & Assoc., Inc.

Paul Osborn

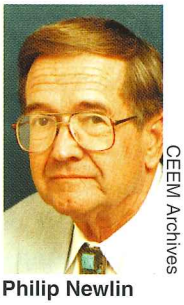
Philip Newlin scholarship goal set at $10,000

CEEM is seeking donations to reach the $10,000 minimum needed for an endowed scholarship to honor longtime surveying professor Philip B. Newlin.

The Philip B. Newlin Memorial Surveying Engineering Scholarship is presented to outstanding surveying students in UA CEEM.

Endowed scholarships continue in perpetuity, with scholarship awards funded by interest earned on the principal.

Newlin earned his degree from UA civil engineering in 1945 and stayed on to support and expand the surveying program that was taught at that time by John C. Park, who eventually was dean of the college from 1951-1958.



CEEM Archives

Philip Newlin

Newlin retired in 1984, after 38 years of teaching. During that time, every civil engineering student at UA took at least one class from him.

Newlin organized several Arizona Land Surveyor's Conferences and started a course in photogrammetry, the 3-D interpretation of aerial photographs.

The Newlin Scholarship was started with a gift from Robert Rasmussen, vice president and chief engineer for Transtec, Inc. in Austin, Texas. While at UA, Rasmussen worked as a senior teaching assistant in CE 251, Elementary Surveying.

Alums can help to expand and support this scholarship by sending their donations to Rudy Jimenez, CEEM Dept., P.O. Box 210072, The University of Arizona, Tucson, AZ 85721-0072. Please make checks payable to the University of Arizona and be sure to note in the memo field that this donation is for the Newlin Memorial Scholarship. Otherwise the checks will go into the UA general fund.

Traffic

Continued from Page 1

monitor traffic in an area for an hour or more.

The field of view could be anything from a single intersection to a regional view of a city. Satellites now can differentiate between cars, small trucks and large trucks.

Applications include just about everything dealing with traffic, Hickman says. One of these could be timing traffic signals.

By identifying large groups of cars — known as "platoons" in traffic lingo — the signals could be timed so the platoon goes through the intersection without stopping.

"The best that can be done with loop data is to sense that some cars were observed a certain distance from the intersection at a certain point in time," Hickman says. "Whether those cars will get to the intersection before they turn off and just how fast they get there is difficult to estimate." In the future it may be feasible to use a satellite in geosynchronous orbit or even a ballon to continuously monitor traffic platoons near a city's major intersections.

Remote sensing also can be used to determine the wear on a roadway based on the numbers and types of vehicles that use it. This data can help determine where and when roadway improvements should be needed.

Still, remotely sensing traffic from balloons, aircraft and satellites is not without its problems. Current satellites are limited to the frequency with which they pass over an area. And all these devices are expensive to operate.

"We are in the first year of this grant," Hickman says. "Right now we want to determine the capabilities of remote sensing for taking traffic counts and identifying traffic flow variables. Primarily, we want to determine how to best trade off the cost of data collection versus the data quality. We will spend our first year figuring out trade-offs with cost, field of view, spatial resolution and the frequency with which one can get data."

In the end, Hickman says, "The challenge of transportation engineering is figuring out the best way of providing people with mobility, given the constraints of the system. Traffic flow data is an important ingredient in finding where these mobility needs are ."

Haldar

Continued from Page 1

one student said. "Then I took steel design with Dr. Haldar; this changed my whole attitude about school and structural engineering."

University Photo Center

Achintya Haldar

Haldar uses video, physical models, computers, creative class assignments and just about anything else that might help students grasp complex engineering topics. His door is always open to students and he offers mentoring, career counseling and academic help not only while on campus, but also from home.

When he is away from campus and has to miss a class, he reschedules it to Saturday and makes it an event for his students – providing donuts and an informal atmosphere. His students show up for these "Saturday events" because they don't want to miss his class.

Haldar is actively involved in curriculum development and modification both at the graduate and undergraduate levels and recently played a major role in the preparing the department for an accreditation visit by ABET.

"All senior faculty members are supposed to participate in this type of activity," Valdés says. "However, what is unique about Dr. Haldar is that all faculty members want him to be a member of the team."

Haldar recently published two textbooks, "Probability, Reliability, and Statistical Methods in Engineering Design" and "Reliability Assessment Using Stochastic Finite Element Analysis." The first already is being used by some major universities, including UA. The second may be the first book of its kind.

Haldar teaches steel design courses and has initiated several hands-on projects that help students grasp the nuances of designing steel structures,

He also includes as many undergraduates as possible on his research projects.

One of his students said, "What made this class so much fun was that he truly loved what he was doing and it showed. When assistance was needed outside of class, he was always willing to help students understand... I feel privileged to have met such a devoted professor and wonderful friend."

Haldar says he also feels privileged to be recognized for what he enjoys doing most — teaching.

"I try not only to teach the basic course work, but also try to stimulate the students' interest by discussing my research work, whose results are less obvious than standard classroom problems.

"I try to work with my students inside and outside of the classroom to achieve the objectives. At the end of the semester, when everything falls into place and I see their smiles, that is the best award a teacher can receive."

New Faculty

CEEM welcomes three new faculty members to the department. All three are registered Professional Engineers.

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Robert Fleischman

Education:

BS Civil Engineering, 1985, Carnegie-Mellon University.
MS Civil Engineering, 1989, Lehigh University.
Ph.D. Civil Engineering, 1995, Lehigh University.


Phyllis M. Fleischman

Before coming to UA

Assist. Prof. of Civil Engineering and Geological Sciences at Notre Dame.

Honors and Awards:

- NSF Faculty Early Career Development (CAREER) Award, 1997.
- PCI Daniel P. Jenny Research Award Winner, 1996
- Co-Inventor of United States Patent 5,244,300 & International Patent.

Teaching at UA:

CE 336 — Structural Design in Steel.

Research Interests:

Seismic-Resistant Design of Building Structures. Active research includes:

- Development of innovative modular nodes for beam-to-column joints in steel moment-resisting frames.
- Development of new post-tensioned steel connecting systems.
- Investigations in the applicability of partially-restrained steel frames in high seismic zones.

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Scott Merry

Education:

BS Civil Engineering, 1991, the University of Arizona.
MS Civil Engineering, 1993, Purdue University.
Ph.D. Civil Engineering, 1995, the University of California, Berkeley.


Laura Merry

Before coming to UA:

Assist. Prof. in the Department of Civil and Environmental Engineering at the University of Utah.

Honors and Awards:

- Outstanding Young member, International Geosynthetics Society, 1998.
- Nominee, Utah Engineering Educator of the Year, Consulting Engineers Council of Utah, 1998.
- Award of Excellence, State-of-Practice Technology Division, Geosynthetics '95 Conference, 1995.

Teaching at UA:

CE 445/545 — Geoenvironmental Engineering (a course initiated by Merry).
CE 441/541 — Earth Structures
CE 340 — Geotechnical Engineering
CE 400 — Senior Design

Research Interests:

Merry's current research interests include aerobic degradation of solid waste in landfills, geoenvironmental engineering including materials and testing techniques used in design and construction of waste containment systems, and the performance of pile foundations in soft clays.

•

Mark Hickman

Education:

BS Civil Engineering, 1988, Massachusetts Institute of Technology.
MS Transportation, 1988, Massachusetts Institute of Technology.
Ph.D. Transportation, 1993, Massachusetts Institute of Technology.


Ed Stiles

Before coming to UA:

Assist. Prof. in the Civil Engineering Department at Texas A&M University.

Honors and Awards:

- NSF Faculty Early Career Development (CAREER) Award, 2000

Teaching at UA:

CE 360 — Transportation Engineering

Research Interests:

Hickman's research interests focus on uses of software and information technology in transportation. His areas of interest include:

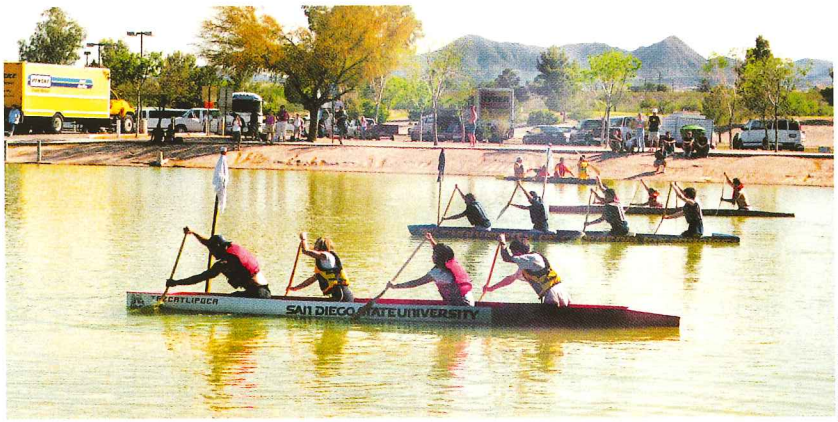
- Software for traffic surveillance and control
- traffic signal timing to incorporate bus movements ("bus signal priority")
- Traveler information systems and their effect on traveler behavior
- Methods for scheduling and operating public transit service.

ASCE Pacific SW Conference

The UA student chapter of ASCE organized and hosted the 2000 ASCE Pacific Southwest Conference, which was attended by more than 500 engineering undergrads from 17 schools.

The event, held April 6-9, was highly successful.

A special thanks goes to the sponsors, especially Balance Bar, the CEEM department, the College of Engineering and Mines, the Arizona Section of ASCE, the Southern Arizona Branch of ASCE, the Southern Arizona YMF and Robert Bein William Frost & Associates.



Ed Nowatzki

Teams await the starter's signal during the Concrete Canoe Competition at the 2000 ASCE Pacific Southwest Regional Conference in Tucson. The conference was organized by the UA student chapter of ASCE. More than 500 students from 17 schools attended.

Haire wins ASCE's Tapman scholarship

Ashley R. Haire, who graduated in May, won the Samuel Fletcher Tapman Scholarship during the 1999-2000 school year.

Haire was the chair for the 2000 ASCE Pacific Southwest Regional Conference in Tucson.

She also has served as ASCE student chapter vice president and was founding editor of the chapter newsletter. While at UA she was a member of the UA Honors Program, and a teaching assistant in a surveying lab. In the summer of 1999, Haire was involved as a student intern in a transportation program at the University of Texas at Austin.

Haire was one of 16 recipients of the Tapman scholarship, each of which received $2,000 to help defray educational expenses.

Currently, she is working on a master's degree with emphasis on transportation engineering at the University of Texas in Austin.

ASCE students win honorable mention

The Arizona ASCE Student Chapter won Honorable Mention from ASCE for its outstanding activities during 1998-1999. Among the chapter activities were the Popsicle Stick Bridge Competition during Engineers Week; participation in the Pacific Southwest Regional Conference; Career Night, which brought together students and company representatives, a holiday dinner; and a Canoe-A-Thon.

Faculty write three new civil engineering texts

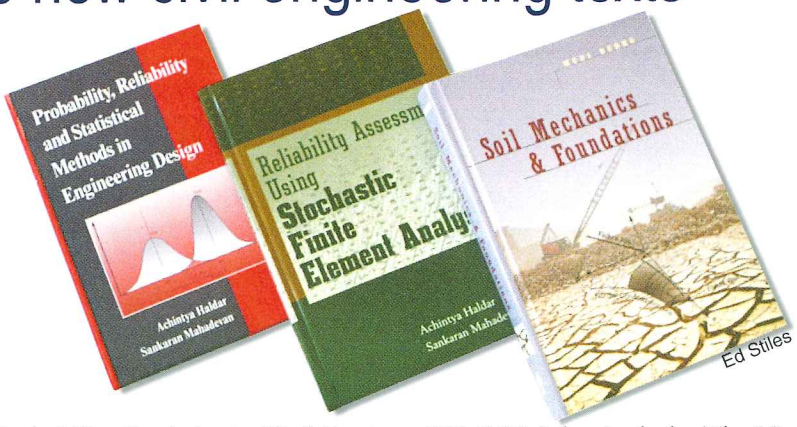
CEEM faculty members published three books during this year.

Professor Achintya Haldar and Sankaran Mahadevan (of Vanderbilt University) co-authored "Reliability Assessment Using Stochastic Finite Element Analysis." Haldar also wrote "Probability, Reliability and Statistical Methods in Engineering Design."

Meanwhile, Professor Muni Budhu wrote "Soil Mechanics and Foundations."

Two of the three books are being used in CEEM classes — CE 310, Probability Statistics in Civil Engineering, and CE 340, Soil Engineering.

Budhu's book also features a CD-ROM that includes The Virtual Soils Laboratory, which allows readers to conduct virtual soil testing experiments.



Ed Stiles

Retirements

Simon Ince

Professor Simon Ince retired in January after more than 30 years at UA.

He first came to UA in 1963 as a visiting professor from the National Research Council of Canada, and joined the UA faculty full time in 1971. He had a joint appointment in Civil Engineering and Hydrology and Water Resources (HWR), and he directed the HWR field camps from 1980-1999.

Ince has worked on environmental and water quality problems on the Colorado River, led a multi-disciplinary team in the study of the Upper Pampanga River Irrigation Project in the Philippines and was a team leader on a project for rehabilitation and/or construction of agricultural research stations along the Senegal River in Senegal, Mali and Mauritania.

University Photo Center

He led a team in preparing a paper on supplemental irrigation in Morocco and he also was a team leader for a project paper on strengthening agricultural research in Senegal.

Ince was advisor to the graduate water resources program at the Instituto Tecnologico de Sonora in Mexico.

In the private sector he worked as a consultant to companies on hydrology, coastal engineering and harbor development.

Ed Nowatzki

Professor Ed Nowatzki retired in July after being affiliated with UA Civil Engineering for 18 years.

He earned his MS in 1965 and his Ph.D. in 1966 at UA. After that he was in industry and consulting for ten years.

Nowatzki returned to UA in 1975 and was on the faculty until 1989.

In 1989, he left UA to serve as department head in the Civil and Envrionmental Engineering Department at Cal Poly in San Luis Obispo, Calif. That program had an 800-student undergraduate program.

In 1995 he returned to Tucson to open Envirotech Southwest, LLC, which he co-founded with Blaine Reely, a former graduate student of his at UA.

In the fall of 1996, Ernest T. Smerdon, who was then dean of the College of Engineering and

University Photo Center

Mines, asked Nowatzki to return to UA CEEM to help the department get through the ABET accreditation process. The college was looking for a new department head at the time and needed an experienced person to prepare the department for the ABET review.

After the ABET review, Nowatzki stayed on as an instructor, advisor to undergraduates and unofficial assistant department head.

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