

# THE REDLINE

NEWS FOR ALUMNI AND FRIENDS OF THE UNL DEPARTMENT OF CIVIL ENGINEERING



FALL 2015

## From the Department Chair



Daniel Linzell, Chair

As I write this welcome message, hints of fall are becoming apparent: shorter days, cooler temperatures, a bit of color to the leaves, and (of course) Husker football.

This is a busy, but exciting, time in the Department of Civil Engineering, as many faculty and existing undergraduate and graduate students are in the midst of transitioning from focusing their efforts on research and the practice of civil engineering to efforts that now include formal instruction and learning. It is when new students, both to the university and to our department, are experiencing many aspects of campus life for the first time and are very excited (and maybe a bit nervous) about what is to come.

The second edition of THE REDLINE was assembled thinking of this energy and its influence on our activities. The premise is that the business that our department is wholeheartedly invested in is scholarship, centered on our students and their activities and successes. Based on this premise, you will notice that a portion of this edition focuses on many of our active student groups and their accomplishments throughout the 2014-15 academic year. This is a snapshot of the work our students are involved in outside the classroom. Some of our top individual student accomplishments are also highlighted, ranging from brilliant undergraduates garnering top national awards to extremely skilled and hardworking graduate students garnering accolades at our college's graduate student award event.

We would not be able to attract and retain high quality students if it were not for our hard-working



Students in CIVE 112, our freshman seminar class, receive red Civil Engineering T-shirts. When the students are professionally admitted to Civil Engineering after their fourth semester, they receive black shirts!

faculty. Their activities and successes, along with information on our exciting new additions for the fall of 2015, are also highlighted.

I would particularly like to point out stories detailing research related to neutralizing lethal proteins in mammals that Dr. Shannon Bartelt-Hunt and her students are involved with and the nondestructive forensics work Dr. Richard Wood is leading in the wake of the deadly tornados that struck Pilger, Nebraska. These projects show that our growing cadre of faculty members are involved with cutting-edge and timely research while also demonstrating the breadth of work that is Civil Engineering.

The energy I speak of certainly does not end when a degree is received, as our alumni continue to do many great things and enthusiastically support the department. Don Voelte ('75 CIVE) epitomizes this energy and certainly demonstrates how far a Civil Engineering degree from our university can take someone as discussed in an article that speaks to his well-deserved selection as the College of Engineering Alumni Master last fall. Don and many other alumni have wholeheartedly supported the various social

## From the Department Chair . . . continued

activities we planned last year, including the get-together we had before the UNL-UNO baseball game that is also highlighted. Alums, be on the lookout for more activities!

I'd like to end this year's message by recognizing those who helped harness our students' energy, who have now departed. Dr. John Rohde and Karen Schurr retired this year and I know they touched many lives through their instruction, research and service. We wish them both well in their future endeavors.

I must also unfortunately inform you that three former faculty members passed away: Drs. Joseph Benak and Mark Hammer and Professor Ralph Marlette. By all accounts, all three contributed greatly to our department and to civil engineering in Nebraska, and they are sorely missed. It is their legacies that everyone affiliated with our department attempts to uphold.

Best regards,

Daniel Linzell, Ph.D.,  
Voelte-Keegan Professor and Chair

## Rohde, Schurr retire from department

In the 2014-15 academic year, two faculty members retired from the Civil Engineering Department.

**John Rohde**, Ph.D., taught and conducted research at UNL for 24 years, in such areas as transportation engineering, geotechnical engineering and foundation engineering.



John Rohde

Rohde was active in the development of the SAFER Barrier, created by engineers and researchers at UNL. Within this research, he was part of receiving such awards as the 2004 Inaugural Pioneering and Innovation Award presented at the Autosport Awards Banquet in London, as well as the NASCAR Bill France, Jr. Award of Excellence in 2003.

He served as co-author on numerous articles related to guardrail systems and guidelines, as well as for temporary concrete barriers.

**Karen Schurr** served as a full-time lecturer for 17 years. A graduate of UNL, she was a registered Professional Civil Engineer in Nebraska.



Karen Schurr

Prior to teaching for the department, she worked for the Nebraska Department of Roads for 21 years in a variety of roles, including as an Interstate Design Unit Head and Expressway Design Engineer.

She co-authored numerous journal articles in the areas of highway and road safety, including issues concerning roundabouts, driver behavior studies, and appropriate design speeds for curves approaching a stop.

In 2012, Schurr received a College of Engineering Faculty Service Award.



CIVIL.UNL.EDU / ENGINEERING.UNL.EDU / FOLLOW US ON FACEBOOK



## Showcasing our Student Groups

We asked leaders in our Civil Engineering student clubs and organizations to tell us how they are doing and what they are focusing on. As well as juggling full course loads, our students on both campuses are contributing valuable time and skill sets to enhance their college experiences.

### American Society of Civil Engineers (ASCE)

The American Society of Civil Engineers (ASCE) has chapters on the Lincoln and Omaha campuses, and each group meets monthly during the academic year, bringing in local professionals to talk about civil engineering-related topics. Chapter meetings expose students to a diverse slate of engineering topics and professionals. In Omaha, brown bag lunches were held regularly in the spring for students to get to know their professors in a more casual environment.

Each chapter strives to have three competition design teams every academic year: the steel bridge team, the concrete canoe team, and a team that constructs and competes with a concrete bowling ball. In addition, a student from each chapter writes and presents a technical paper related to engineering ethics. The teams compete in ASCE's Mid Continent Region, and they share resources and support each other. Last spring, the conference was held in Lawrence, Kansas; next year's Regional Conference will be at Missouri S&T in Rolla.

Student steel bridge teams design a reduced-scale bridge based on an extensive set of rules that calculate a total "cost" based on effectiveness of the design as a function of bridge weight, construction time, stiffness, and aesthetics. Each concrete canoe team designs and builds a full-sized canoe that is subjected to a series of tests and races and produces a technical paper that describes the entire design, fabrication and construction processes. These teams focus on minimizing weight and drag while maximizing structural efficiency. The bowling teams focus on creating a design and mix that produces a ball that is then used in a student bowling tournament. These teams all begin their work in the fall by completing initial analyses, designs and material optimization; this work extends into the spring, with the regional competition occurring after spring break. At last spring's regional competition, the Lincoln-based steel bridge team had the fastest steel bridge construction time; the canoe team earned the third best technical paper, and the bowling ball team came in first place.

Both chapters also participate in Engineers Week (E-Week) during the spring semester. In Omaha, members helped with the E-Week School Blitz by pairing up with a practicing engineer to prepare and deliver a presentation to local school students that promoted civil engineering. Lincoln members assisted with the E-Week Open House by displaying their concrete canoe, steel bridge and bowling ball and discussing those projects and ASCE activities.



## Showcasing our Student Groups



Civil Engineering students showcased their work at the college's E-Day in April at Nebraska Innovation Campus.

ASCE also offers leadership development opportunities for officers via attendance at their Workshop for Student Chapter Leaders, a multi-day event for student leaders from across the nation to network, plan and organize activities on their home campuses.

In January, four officers from the Omaha Chapter attended the workshop in Houston, where they formulated plans for their group, including development of a clear mission statement.

### Chi Epsilon (Omaha and Lincoln Chapters)

Being a member of Chi Epsilon, the National Engineering Honor Society, means observing four "pillars": scholarship, character, sociability and practicality. The Omaha and Lincoln chapters supported development of these traits throughout the 2014-15 academic year.

#### Fall 2014

To promote sociability, both chapters organized specific activities. In Omaha, students met at the home of one of the officers and enjoyed a fabulous Greek dinner, complete with homemade baklava, and a volleyball game. The Lincoln chapter held a fall initiation ceremony, adding six students and elevating Steven McCullough to Honor Member status in December. McCullough is a UNL graduate with over 18 years of experience working for HDR and Alfred Benesch and Company. His experience includes such projects as the West Dodge Expressway.

#### Spring 2015

Spring served as an opportunity to enhance members' leadership skills and to increase membership: In March, three Omaha chapter officers attended the Central District Conference at Oklahoma State University, where they learned practical information to help run a successful chapter. Every chapter delivered an annual report, and the Omaha chapter received first place for their presentation.

Students also participated in E-Week activities, including the E-Week School Blitz with the Nebraska Section of ASCE. Students worked with professionals to prepare an age-appropriate lesson and activity related to civil engineering and then delivered their presentations to local schools.

During April initiations, 23 new members were added: 10 in Lincoln and 13 in Omaha.



## Showcasing our Student Groups



### Institute of Transportation Engineers (ITE) - Nebraska Chapter

In the fall of 2014, the University of Nebraska Chapter of the Institute of Transportation Engineers (ITE) increased its membership by 20 members. The group attended the 2014 Fall MOVITE Meeting in Lincoln, featuring many technical presentations and the opportunity to network with professionals.

In the spring, ITE held two meetings featuring presentations by professional engineers. The first presentation was by Mark Meisinger from Felsburg, Holt and Ullevig. He talked about a traffic study performed for a new interchange to be built in Vail, Colorado. The second presenter was Jim Jussel from Benesch, who presented the steps and processes of a typical project using a diverging diamond interchange project he was involved with.

### Structural Engineers Association of Nebraska (SEAoN)

The Structural Engineers Association of Nebraska Student Chapter organized several tours and activities for members during the 2014-15 academic year.



SEAoN students toured UNO's Baxter Arena, still under construction.

In October, 25 students gathered for a presentation by Kiewit of the new UNO Baxter Arena in Omaha and then toured the arena with John Savage of HDR, the structural engineer of record. Also present were another structural engineer and architect from HDR.

In March, a tour of the new Fred and Pamela Cancer Center at UNMC was held. Students met at the Kiewit Building Group job trailer for a presentation by Tom Rickert, project manager. Mike Kuhse of HDR, the structural engineer of record, led the tour. Also presenting was Seth Hoffman, a project structural engineer for Kiewit Building Group.

Seventeen students drove to Norfolk for an all-day tour of the Nucor Detailing Center and Nucor Steel Mill in April. In the morning, they had a presentation by Nucor Nebraska general manager and other management followed by a tour of the Vulcraft Joist and Deck Plants. They then traveled to the Nucor Detailing Center. In the afternoon, they toured the Nucor Steel

Nebraska mill with structural engineer Eric Fossum, as well as two mechanical engineers and a metallurgical engineer.

### Engineers Without Borders (EWB-NU)



Members of EWB-NU returned to Madagascar this summer as part of a 10-year commitment to help the village of Kianjavato improve its infrastructure and, ultimately, quality of life. Two teams of students helped the village improve its access to clean water (in May) and installed solar panels to provide electricity to schools (in August). Advisors are Dr. Libby Jones and Dr. Shannon Bartelt-Hunt. EWB

began making service trips to Madagascar in 2008.



## Researchers show how the environment can neutralize lethal proteins in mammals



Shannon Bartelt-Hunt

Watering and drying soil as few as 10 times can reduce the presence of prions and curb their ability to infect normal proteins in brain tissue.

Prions can enter the environment through the blood, saliva, waste or decomposition of their hosts. Once embedded in soil, where they can survive for years, they jump to new hosts through ingestion or inhalation. Much like viruses hijack cells to replicate themselves, prions multiply by inducing healthy proteins to refold into dysfunctional shapes.

The researchers discovered that the environment's ability to disrupt this process depends partly on soil and mineral composition, with clay and silt neutralizing prions better than sandier soils. This knowledge could help determine where the spread of prion diseases is most likely to occur, Bartelt-Hunt said.

The study further suggested that the type of prion infection may moderate environment-protein interactions. Chronic wasting disease – which afflicts deer, elk and moose – showed greater susceptibility to the watering-drying cycles than did a prion strain that targets mink.

Though the team has yet to determine how the cycles affect prions, Bartelt-Hunt said it's embarking on new research to investigate the mechanisms underlying the new study's results.

The team's study appeared in the Feb. 9 edition of the journal PLOS Pathogens. Bartelt-Hunt's co-authors included UNL's Qi Yuan, recent doctoral graduate in civil engineering; Creighton's Jason Bartz and Thomas Eckland, associate professor and doctoral candidate in medical microbiology and immunology, respectively; and Colorado State's Glenn Telling, professor of microbiology, immunology and pathology.

—Story courtesy of University Communications

Botching a few paper folds might transform an origami cow into a deer or sheep. When cellular proteins do the same, however, they can trigger fatal neurodegenerative diseases that turn the brains of these mammals into dysfunctional sponges.

A new study suggests that these misfolded proteins – the so-called prions responsible for chronic wasting disease, among others – can be degraded by the rain and sun that fall upon the soil where these prions reside.

Researchers from UNL, Creighton University and Colorado State University found that watering and drying soil as few as 10 times can reduce the presence of prions and curb their ability to infect normal proteins in brain tissue.

“We know environmental prions remain infectious, but there is little information about how natural processes influence soil-bound prions,” said co-author Shannon Bartelt-Hunt, associate professor of civil engineering.

“Wetting and drying can affect soil properties, and drying can also influence protein structure. We were interested specifically in the behavior of the protein attached to surface soils, so we wanted to evaluate a process that routinely occurs in the environment.”

## Civil Engineering grad Voelte chosen as Alumni Master



Don Voelte, 1975 CIVE graduate

Don Voelte, '75 CIVE, was one of 10 outstanding UNL alumni who took part in the university's November 2014 celebration of the 50th anniversary of Alumni Masters Week.

Voelte served as managing director and CEO of Seven Group Holdings from 2013 until his retirement in August 2015. He was also chair of Coates Group Holdings and chair of Nexus Energy Limited. He previously served as director of Seven West Media Limited and was with West Australian Newspapers Holdings Limited.

He is a University of Nebraska Foundation trustee, and in 2012 was appointed an honorary officer within the general division of the Order of Australia. He is also a member of the UNL College of Engineering Advisory Board

In 2011, Voelte and his wife, Nancy Keegan, chair of the University of Nebraska Foundation's board of directors, gave a \$5 million campaign gift to UNL. In recognition of their gift, the new Nanoscience Metrology Facility was named in their honor. The \$13.9 million nanoscience center is on the corner of 16th and W Streets and adjoins Jorgensen Hall, home of the Department of Physics and Astronomy.

Since 1964, 400 alumni have participated in Alumni Masters Week, where they connect with students who benefit from their experiences and knowledge.

## ACCOMPLISHMENTS / UPDATES

**Tyler Schmidt, a graduate research assistant at UNL's Midwest Roadside Safety Facility,** was awarded first place in the student presentations at the International Highway Engineering Exchange Program Conference in New Orleans in October. His presentation centered on the development of a low maintenance, energy-absorbing vertical barrier to help decrease the severity of crashes on urban highways.



Steven Stauffer

**Steven Stauffer, master's-level graduate student,** was awarded a \$3,000 American Institute of Steel Construction Education Foundation national scholarship this summer. The AISC awarded \$65,000 in scholarships to 20 students across the country. He is working with assistant professor Joshua Steelman on a project for the Nebraska Department of Roads.

**Shannon Bartelt-Hunt, associate professor,** was one of 24 U.S. scientists selected to participate in the second Arab-American Frontiers of Science, Engineering and Medicine Symposium in December 2014 in Muscat, Oman. The symposium centered on building international collaborations for research on such environmentally focused topics as water reuse and hydraulic fracturing of energy production.

Nebraska Gov. Pete Ricketts appointed **Daniel Linzell, chair,** to the eight-member Nebraska Board of Engineers and Architects, which oversees the laws and rules for licensing engineers and architects. Linzell is also one of five UNL faculty members taking part in the Committee on Institutional Cooperation's Academic Leadership Program, which addresses challenges of academic administration.

## ACCOMPLISHMENTS / UPDATES



Maria Szerszen

A team of civil engineers from UNL, headed by **Associate Professor Maria Szerszen,** joined the Nebraska Department of Roads in testing stress levels on two 80-year-old bridges in Lincoln before demolition began in May. They used 32 sensors at key structural points to measure the impact of additional weight compared to the span rate.

**Professor Chris Tuan** was granted a U.S. patent for his concrete mix design for EMP shielding.



Chris Tuan



Bruce Dvorak

Three UNL faculty, led by **Professor Bruce Dvorak,** are part of WINSSS, a national project that hopes to bring up-to-date technology and safer water to America's small communities. It is funded by a three-year, \$4.1 million grant from the U.S. Environmental Protection Agency, headquartered at the University of Massachusetts-Amherst. According to Dvorak, "The EPA wants researchers to start taking technologies – like off-the-shelf sensors and point-of-use devices – and adapt them for the unique situations of small water systems, so that entrepreneurs can start making them available for the actual systems."

**Dvorak** also spearheaded an effort to have UNL selected to participate in the Department of Defense's Cooperative Agreement for Research and Program Assistance at Installations Supported by the Kansas City District. This includes an estimated \$15 million for participating institutions.

**Associate Professor Tian Zhang** received the ASCE State-of-the-Art of Civil Engineering Award in 2014. He co-authored "Climate Change Modeling, Mitigation, and Adaptation" in 2013, presenting environmental mechanisms that contribute to global climate change and exploring scientifically grounded steps to reduce the buildup of greenhouse gases.



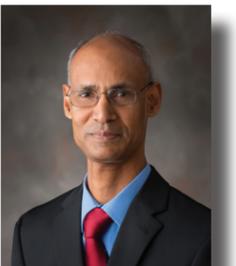
Tian Zhang



Xu Li

A team of researchers, headed by UNL Civil Engineering **Associate Professors Xu Li and Shannon Bartelt-Hunt,** received the 2015 Grand Prize for University Research by the American Academy of Environmental Engineers & Scientists. Their research looks at the environmental impact of antibiotics and antibiotic resistance genes from swine manure used as soil fertilizer or conditioner. The team includes researchers from the UNL School of Natural Resources and the USDA Agricultural Research Service.

**Chittaranjan Ray, professor and director of Nebraska Water Center,** co-authored a book entitled "Low Cost Emergency Water Purification Technologies," that is part of the Integrated Water Security Series published by IWA/Elsevier.



Chittaranjan Ray

# Department Additions

The Department of Civil Engineering is pleased to announce the addition of four new faculty members, one new professor of practice and the affiliation of a research assistant professor. Their expertise covers a wide range of teaching and research areas.

## DR. JIONG HU



Jiong Hu

Dr. Jiong Hu received his B.Sc. in Construction Materials and a M.Sc. in Materials from Southeast University, China, and his Ph.D. in Geotechnical and Materials Engineering from Iowa State University. He has over 15 years of experience in the professional practice of civil engineering and material science and engineering, particularly in the cementitious materials area.

Hu has served as a principal investigator (PI) or co-PI for 18 projects, with over \$1.5 million in funding. He has published nearly 50 peer-reviewed papers and technical reports, and is currently serving as an editor and reviewer for more than 20 different international and national journals. Hu is an active member of American Concrete Institute (ACI), Transportation Research Board (TRB), and American Society of Engineering Education (ASEE). He is currently serving as chairman, secretary and member of various ACI and TRB committees.

His research interests include advanced cementitious materials, sustainable civil engineering materials and construction, concrete with recycled materials, self-consolidation concrete (SCC), fresh concrete properties and rheology of concrete, non-destructive evaluation (NDE) of infrastructures, and infrastructure construction and management.

## RANDALL PETERS



Randall Peters

Randy Peters has joined the department as an associate professor of practice. Previously he served as the 28th Director-State Engineer for the Nebraska Department of Roads. As chief executive officer of one of Nebraska's largest state agencies, Peters led a multidisciplinary workforce of over 2,100 employees, directing the planning, design, construction, maintenance and operations of the state's 10,000-mile surface transportation network.

During his tenure, the Omaha-to-Lincoln corridor of Interstate 80 was modernized and expanded to six lanes. He led the successful development of a program to implement the Nebraska Unicameral's \$1.2 billion "Build Nebraska Act".

Peters earned his bachelor's degree in Civil Engineering from UNL and is a licensed Professional Engineer in Nebraska. Before his appointment as Director-State Engineer, his career was comprised of over 35 years within the Nebraska Department of Roads, including Deputy Director of Engineering, Planning and Project

Development Engineer, and State Traffic Engineer.

## Department Additions, cont.

## DR. JOHN SANGSTER



John Sangster

Dr. John Sangster joined the department this fall as an assistant professor. He received his Ph.D. and M.S. degrees in Civil Engineering from the Virginia Polytechnic Institute and State University.

Previously, he worked for seven years as a practicing consulting engineer. Two of those years were spent with Alvord, Burdick, and Howson in Chicago, Illinois, with work primarily focused on potable water treatment and distribution systems.

Most recently, he worked for five years with Stantec Consulting in New Hampshire, performing corridor and traffic impact analysis studies, as well as roadway design and municipal services engineering. His research focuses on transportation engineering, with particular interest in traffic operations, geometric roadway design, and traffic flow theory.

## DR. JENNIFER SCHMIDT



Jennifer Schmidt

Dr. Jennifer Schmidt is a research assistant professor and holds an appointment with the Midwest Roadside Safety Facility (MwRSF). She obtained her Ph.D. in civil engineering from UNL in 2012 and is a licensed civil engineer in Nebraska. Schmidt's primary focus is the analysis and design of roadside safety hardware through the use of non-linear finite element analysis.

Current research includes the design and evaluation of a bridge rail and deck system subjected to a vehicular impact by an 80,000-lb. tractor-trailer and the development of new barrier designs for highway applications adapted from the SAFER Barrier technology.

Prior research achievements include the development a new accident reconstruction methodology for vehicular crashes into low-tension cable barrier systems, investigation into the effects of steel strength variation on the performance of W-beam guardrail systems, and development of design guidelines for temporary work-zone devices under MASH.

## DR. CHUNGWOOK SIM



Chungwook Sim

Assistant Professor Dr. Chungwook Sim came from Purdue University, where he was a postdoctoral research assistant at the Center for Earthquake Engineering and Disaster Data. He earned his Ph.D. from Purdue University, his M.S. from the University of Texas at Austin, and a B.S. from Yonsei University in Seoul, Korea.

Previously, he worked at Hyundai Research Institute of Construction Technology as a research structural engineer. His research interests include health monitoring of aging infrastructure, modeling and testing of reinforced concrete members, and the development of data repositories for multi-hazards.

He is currently working on a project that received an award from the NSF "Data Infrastructure Building Blocks (DIBBs)" program (\$1.5 million for three years), which deals with the creation of a modular platform for research data archiving, exploration analysis, and dissemination.

**DR. CHUNG SONG**



Chung Song

Dr. Chung R. Song obtained his B.Sc. from Yonsei University in Seoul, Korea and an M.Sc. from the University of Texas at Austin, with an emphasis in Soil Dynamics. From 1987-88, he honorably served the Korean Army.

While working for Sun Jin Engineering Co. Ltd. and Daewoo Engineering Co. Ltd., as a senior geotechnical engineer, he worked on many national and international projects. He has published approximately 150 technical articles, three book chapters and two books.

He earned his Ph.D. from Louisiana State University in 1999. He then worked for Sambo Engineering Co. Ltd. as director of Tunnels and Infrastructure Division. In 2001, Song qualified as an APEC Engineer, an internationally acknowledged professional engineering designation in more than 20 countries.

He taught geotechnical engineering at the University of Mississippi as an associate professor until the summer of 2015. His current research covers multi-scale mechanics including emerging nano-mechanics, multi-physics analysis, instrumentations, soil improvements, slope stability, soil erosion, safety assessment of dams, foundations on difficult soil conditions and soil dynamics.



At a Glance . . .

**Jorgensen receives Chi Epsilon National Scholarship**

Shelly Jorgensen knows the final year in her pursuit of a civil engineering degree at UNL will have unusual challenges, but scholarships she received will make things a little easier. Jorgensen, who is a senior in civil engineering, received one of 10 Chi Epsilon National Scholarships. Chi Epsilon is the national honor society for civil engineering. She also received a scholarship from Tau Beta Pi, the national engineering honor society, and from the American Society of Civil Engineers, for her involvement with the student chapter.



UNL civil engineering student Shelly Jorgensen (second from left) and Oklahoma State's Aiden Carmichael (second from right) were chosen as Chi Epsilon national scholarship winners. Also pictured are Glenn Goss, Chi Epsilon national executive secretary, and Deann Sanders, Central District councillor.

“The money that came with the awards,” she said, “will help ease what will be a slightly complicated final year of school.”

“It’s nice ... very timely. This year is a little more expensive because my family moved back to California, and I am in Nebraska for fall semester.”

Jorgensen, by any definition, is a nontraditional student. She’s married and has two sons, one a sophomore at UNL and the other a junior in high school. She also has two previous undergraduate degrees - one in pre-health from Utah State University, and one in food science and nutrition from Purdue. Her husband, Bert, works for a California-based national laboratory, which sent him to Omaha on a three-year assignment as a special scientific advisor at STRATCOM - the U.S. Strategic Command based at Offutt Air Force Base, near Bellevue.

Bert, who has a Ph.D. in mechanical engineering, was an inspiration for Jorgensen to study engineering.

“I stayed home with my kids when they were young, but when they got older and I wasn’t busy volunteering at school, I decided to go back to school myself,” Jorgensen said. “My husband said, ‘You should study engineering. You’d be good at it.’ So when we moved here, I decided to try it out. I’ve enjoyed it and it’s gone very well.”

During the summer Jorgensen had an internship at Lawrence Livermore National Laboratory, which is east of the San Francisco Bay Area, in Livermore, California.

“Working at the lab was an amazing opportunity,” Jorgensen said. She was able to work in the Materials Engineering Division and participate in research and modeling to predict the stress-strain behavior of the metal tantalum at extreme temperatures.

“The laboratory was a great place to have an internship because they make an effort to expose their interns to all the different types of science taking place at the lab. I made some great connections with amazing people who do very interesting work, and would love to work there in the future.”

“My current plan is to work at the lab for a year after I graduate in May, and then pursue a Ph.D. in materials engineering at a Bay Area university—probably Berkeley or Stanford,” Jorgensen said. “Working at a national laboratory is my ultimate goal, so I would like to return there when I am done with my Ph.D.”

Jorgensen misses her family, of course, but says time is passing quickly and looks forward to a few trips to sunny California during the semester.

# Engineers, students analyze wreckage from Nebraska tornado



Assistant Professor Richard Wood and several Civil Engineering students stand in front of Pilger Middle School, which was damaged by a tornado in 2014.

Using a high-tech laser scanner and a drone, a UNL civil engineering professor and his graduate students have analyzed the wreckage after a tornado ripped through the town of Pilger, Nebraska, nearly a year ago.

The tornado killed two people, injured 20 and destroyed dozens of homes and buildings, including St. John Lutheran Church. The Wisner-Pilger Middle School building was damaged beyond repair.

Just days after the storm, Assistant Professor Richard Wood and graduate student Gulipiye Abudukadier made the first of three trips to Pilger to study the damage. They were joined by doctoral student Ebrahim Mohammadi on the third

visit.

Their mission: to detect where engineering fell short, leaving key buildings vulnerable to the tornado's punishing winds; and to develop computer algorithms for remotely detecting structural damage caused by tornadoes, earthquakes and other events.

"By doing this, we can examine the exterior of the structure, and in specific cases, its interior, from afar," Wood said. "It provides safety to the inspectors and allows for an electronic collection of data for use by others."

Wood studied earthquake damage in California before joining UNL in 2013. His trip to Pilger was his first foray into studying tornado damage.

Richard Wood

Wood and the students examined six sites, the middle school most prominent among them. Using data collected from a LiDAR (Light Detecting and Ranging) 3D scanner and photogrammetry from a camera-equipped tethered drone, they created a point-cloud model of the school building.

The model, which appears as a 3D image of the school building that can be rotated to different angles on the screen, helped them identify how the building was damaged by the storm.

Their soon-to-be completed report will be provided to the school district and posted to UNL's Digital Commons, an open-access online repository of academic papers and similar materials.

"It is data mining," Wood said. "We assemble millions of data points and look for changes in the surface geometry to detect damage. We're statistically determining the potential quantity of damage, and the whole point is to do it in terms of minutes, not hours."

Read the entire story: <http://engineering.unl.edu/news/>

—Story courtesy of University Communications

## EVENTS & ACCOLADES

### Alumni Event

The Department of Civil Engineering hosted a "Night at the Ballpark" for current students, alumni and their families in Omaha. The event was held April 1 at Old Chicago in Papillion, followed by the Huskers vs. the UNO Mavericks at Werner Park.



### Student Recognition



▲ ABOVE: Each year, the College of Engineering hosts a reception for graduating seniors on the Lincoln campus. This event is held prior to Commencement, and students who attend are recognized individually with their accomplishments while in school and their future plans. Eighteen Civil Engineering graduating seniors participated this year.

▼ BELOW: Several Civil Engineering graduate students received recognition at the College of Engineering's annual Graduate Student Awards Ceremony in May. Pictured with Department Chair Daniel Linzell (left) are Darshan Baral, Milton Mohr Graduate Fellowship; Rachel Levine, Milton Mohr Graduate Fellowship; and Jonathan Brett Salich, College of Engineering Graduate Poster Competition Commendation and recognition as a member of the college Graduate Students Board.



# WE WANT TO HEAR FROM YOU!

## RECOMMEND FUTURE ENGINEERS

Do you have children (or know of students) in high school who are (or should be) considering engineering as a career?

If so, we'd love to contact them and let them know about the opportunities at UNL and our Civil Engineering degree programs in Lincoln and Omaha.

Please use this link for referral information:

[engineering.unl.edu/request-engineering-information/](http://engineering.unl.edu/request-engineering-information/)

## ALUMNI UPDATES

We encourage you to keep in touch and let us know what you are doing in your careers, community, hobbies, etc.!

We are always seeking alumni stories for the department and college, as well as to share with and to inspire our students.

Alumni Update form:

[engineering.unl.edu/alumni-updates/](http://engineering.unl.edu/alumni-updates/)



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## Support the Department of Civil Engineering

The Civil Engineering Department is grateful for the financial support of alumni, corporations, foundations and friends to help enhance our programs, facilities, and technology to benefit our students.

In the past year, \$25,000-plus in scholarships were awarded to more than 20 students, thanks to donations from alumni and friends. These funds help us attract and retain bright, active students who are eager to earn a degree from our program.

Please consider supporting the Civil Engineering Department in any of the following areas: student support, graduate fellowships, or faculty support.

For more information or to donate, go to the University of Nebraska Foundation:  
[nufoundation.org/civilengineering](http://nufoundation.org/civilengineering).