



Biological Systems Engineering

L. W. Chase Hall 100 Years

Respect | Dignity | Acceptance



UNIVERSITY OF NEBRASKA-LINCOLN
SPRING 2017

N

From the Department Head



Mark Riley

Hello, and welcome to the latest installment of the UNL Biological Systems Engineering communication. As our efforts to share the good news of our activities have expanded we have modified our format to this new magazine concept. We want to share our stories more than just rehash a list

of activities and achievements. We hope that you agree that our method is interesting and entertaining.

Since our fall issue, our programs and activities have continued to grow. We welcome three new faculty: **Dr. Tiffany Messer**, **Dr. Yeyin Shi**, and **Dr. Rebecca Wachs** into tenure track assistant professor positions. We are nearing the end of our faculty hiring initiative with one search for an Irrigation/Water Resources Engineer to be located in Scottsbluff at the Panhandle Research and Extension Center. In total, our department now includes 49 faculty (which is spread across 37 FTE), 24 staff (supported on state and sponsored projects), 3 postdoctoral scholars, and about 460 total students. Note that the faculty numbers include a few individuals who are fully in administrative roles. Since 2012, we have hired 27 new faculty total into the department.

This past year, BSE faculty have been tremendously prolific in their grantsmanship. In the fall of 2016 our faculty submitted more grants for sponsored research than in the previous full year. And, most importantly, our faculty have been successful in gaining funding for new projects. A few examples of large projects that are led by our faculty that have either begun in the past few months or are about to start include:

Jeyam Subbiah (Principle Investigator) **Jiajia Chen**, **Ashu Guru**, **Deepak Keshwani**, **Jennifer Keshwani**, **Rick Koelsch**, **Bruce Dvorak**, Mindy Anderson-Knott (Director of evaluation and development) and Brandy VanDewalle (Extension educator in Southeast Research and Extension Center), and from the College of Business Administration, David Rosenbaum and Eric Thompson, "Immersive Educational Game Simulations to Enhance Understanding of Corn-Water-Ethanol-Beef System Nexus," NSF.

Yufeng Ge (Principle Investigator) "VisNIR-based multi-sensing penetrometer for in situ high resolution depth sensing of soil," USDA-AFRI.

Joe Luck (Principle Investigator) **Greg Kruger** (WCREC) and **Santosh Pitla**, "Next-generation spray drift mitigation via field-

deployable, real-time weather monitoring and novel spray nozzle control technologies," USDA-AFRI.

Christopher Neale (Principle Investigator) **Yufeng Ge**, **Derek Heeren**, **Joe Luck**, **George Meyer**, **Wayne Woldt**, "Improving Variable Rate Irrigation Efficiency using a Real-time Soil Water Adaptive Control Model Informed by Sensors Deployed on Unmanned Aircraft Systems," USDA- AFRI.

Lameck Odhiambo (Principle Investigator) and Kristen Olson (Sociology) "Reconfiguring farmers behavior to reduce irrigation water use through water measurements and social norms interventions: a case study in the Republican River Basin," USDA-NIFA.

Angela Pannier (Principle Investigator) "Understanding Molecular Factors that Regulate Initiation of Porcine Embryo Elongation," USDA-NIFA.

As these projects move forward we will be sharing stories and their successes.

Sadly this past year we lost a dear colleague, **Dr. Darrell Watts**, who was a long time faculty member in BSE having retired in July 2000. Darrell passed away on January 10, 2017. Darrell received the Distinguished Service Award from UNL in 1988, honorary professor from the University of Concepcion in Chile in 1997, USDA group honor award for excellence, MSEA project in 1997, ASAE Nebraska Section, Engineer of the Year in 1997, research team award from UNL in 1998 and was inducted into the Biological Systems Engineering Hall of Fame in 2009. His family, including his wonderful wife, Lois, and their friends shared stories with us at a memorial service this past January on East Campus. **Dean Eisenhauer** and **David Jones** organized the event and led the heartwarming discussion.

Of note, this coming year is the 100th birthday of our very own Chase Hall. We are fortunate to have such a sturdy structure located at the pinnacle of the East Campus mall. We are in the midst of major renovations to laboratories in the basement along with updates to facilities in Splinter Laboratories. Our Larsen Tractor Test and Power Museum also continues to evolve. If you have not visited the museum recently, I encourage you to do so.

Exciting times in Biological Systems Engineering at UNL. Stop by and say hello when you have the chance. Go Big Red!

Best regards,
Mark Riley
Department Head
Biological Systems Engineering
University of Nebraska-Lincoln
mriley3@unl.edu



Chancellor Ronnie Green's
"Welcome to the 2016-17 Year"
(8 Aug 2016):

"At the University of Nebraska, we strive for excellence in all that we do. True excellence requires that each individual be able to work and learn in an atmosphere of respect, dignity, and acceptance.

Our commitment to diversity and inclusion requires each of us to continuously ensure our interactions be respectful, protect free speech and inspire academic freedom."

from <http://diversity.unl.edu/our-core-values-beliefs>

"We are a richly diverse community of scholars, representing countless ethnicities, faiths, backgrounds, and academic disciplines – all brought together by a common desire to use the power of education to challenge the world."

President Hank M. Bounds, Ph.D.
University of Nebraska

Chancellor John Christensen, Ph.D.
University of Nebraska at Omaha
Chancellor Jeffrey Gold, M.D.
University of Nebraska Medical Center
Chancellor Ronnie Green, Ph.D.
University of Nebraska-Lincoln
Chancellor Doug Kristensen, J.D.
University of Nebraska at Kearney

Responding to national concerns
(30 Jan. 2017)

Biological Systems Engineering Magazine

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Nicole Iverson, Roberto Lenton, Theodore Lioutas,
Amber Patterson, Daran Rudnick, Wayne Woldt.
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L. W. Chase Hall 100 Years

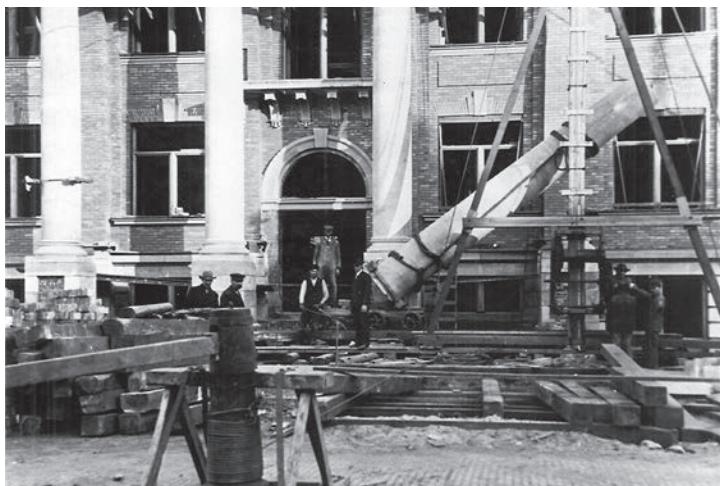


Leon Wilson Chase



The original Agricultural Engineering Hall.

100 years ago Agricultural Engineering Hall was being constructed using a design from L.W. Chase, the department head. Chase was a graduate of Pawnee City High and received his B.S. in Mechanical Engineering in 1904. Prior to graduating, he was an instructor for the Forge and Foundry course. He took a position with Fairbanks Morse Mfg., but returned as Assistant Professor of Farm Mechanics, when his former advisor, J. B. Davidson, left to develop the first Ag Engineering program at Iowa. Chase developed a program of instruction consisting of four years of mechanical engineering and one year of agriculture. He and Davidson traveled annually to Canada to judge Winnipeg Exhibitions' pony brake and plowing



Pillars were brought to site on temporary rail tracks, as pictured here.



The building quartered WWI troops, a truck operator school, and caisson construction.



Women in the drafting lab in the early years of the Agricultural Engineering building.

tests (1908-1913). In 1910, UNL's department was named Agricultural Engineering. Under Chase, it grew to national prominence; he was a charter member of ASAE, serving as President in 1913. In 1914, he earned an M.S. in Ag Engineering from Iowa State, as well as a professional degree in Mechanical Engineering from UNL.

Ag Engineering Hall was dedicated in 1920; it was used for military training in World War I, and became available for classes spring 1919. The building was far advanced for its time, according to W. E. Splinter's "Biological Systems Engineering, the Nebraska History 1895-2012."* It housed perhaps the first soil tillage research facility, having a soil bin 156' long x 12' wide, with an electric driven test carriage and recording dynamometer. The machinery lab had an overhead trolley system to move machines and a series of powered drums recessed into the floor surface to allow students to drive planters and other farm machines in the lab. A hydraulics lab was designed to study irrigation pumps and domestic water systems. The motors lab had a dynamometer to measure engine performance; there was a complete woodworking lab for the farm buildings area. The forge room provided for teaching blacksmithing (the department's first academic course, started in 1904). In 1981, Ag Engineering Hall was renovated to its present condition and was rededicated L. W. Chase Hall, March 18, 1982.

Chase Hall has three floors with about 5,300 m² floor space containing five classrooms, offices and twelve laboratories. The lowest level houses research laboratories, including state-of-the-art biomedical engineering laboratories, and the Swarts Family Teaching Lab. In 1990, under Dr. Glenn Hoffman, the department name became Biological Systems Engineering.

*<http://engineering.unl.edu/bse/history/>





Tractor Testing Inspires Neighbor's Project

Adapted from: "The Tractor Project: Noisy Neighbors Lead to Investigation" Erin Hamel, Mollie von Kampen, Sara Dolezal, Brianna Kennedy, Ashley McConnell, Jordyn Nikkila of Ruth Staples Child Development Laboratory
<http://illinoisearlylearning.org/illinoisipip/projects/tractor.html>

Ruth Staples Child Development Lab is directly south of the Nebraska Tractor Test Lab track. Student teachers noticed that each time children went outside, they ran to the fence to see the large machines and hear the sounds; tractors became a project topic.

Children learned about tractor parts and equipment that can be pushed or pulled by a tractor. They listened for various sounds. A variety of toy tractors came into the classroom. Different sizes and types of equipment were displayed to allow children to explore together. Teachers observed children's play and conversations to determine their understanding of tractors. Children began asking about what they were seeing at the Test Lab: "Where are the tractors going? What does the driver do? Why are the tires big? What are the parts for?"

To launch the project, they took field trips to Larsen Tractor Test & Power Museum. They saw tractors used decades ago next to more modern ones. Their favorite area to explore was a cab that they could climb into and move the steering wheel back and forth, pretending to drive. They noticed the many knobs and buttons in the cab and enjoyed pushing each one. At the end of each visit, they were disappointed they had to leave.

Student teachers contacted the Test Lab to see if it could lend the classroom any "spare parts" to explore. All were thrilled when **Dr. Roger Hoy** volunteered to drive over a lawn tractor, safely secure it, and allow children to explore it in the playground for several weeks!



Children relayed their understandings of the tractor parts through play and conversations. On the flannel board, they could look at pieces closely, take them apart, and put them back together. The teachers wrote down their words and arranged for them to view a video of a tractor with a variety of attachments. Children used clipboards, an outline of a tractor, and crayons of appropriate colors to represent the tractor as they saw it. They used different colors for different parts.



When they returned to Larsen Museum, they compared the tractors with the playground tractor they had been exploring. As they investigated tractors in more depth, they began to ask questions teachers couldn't answer, so a college student from the Test Lab came to talk about tractors. Teachers focused on opportunities for children to see tractors pushing and pulling other equipment and arranged for a hay ride. Children learned that tractors could pull different things and used photographs of the tractor in their outdoor classroom for reference as the tractor pulled them around East Campus. They noticed the sights, sounds, and smells and started to recognize the magnitude of the power of tractors. They were curious about their huge size. Student teachers arranged a visit to the Test Lab.

When the outdoor tractor left, as it was needed for snow removal, the children built their own tractor from scrap materials and recyclables provided by families. The project was shared during a family night. Student teachers created a matching game of tractor parts for children to play with their families and showed the finished project documentation on a bulletin board display, in a photo slideshow, and in a children's book.



In Memorium

Extension Educator



Tom W. Dorn, UNL Extension Educator in Lancaster County, passed away on February 21, 2017. He retired June 2013 after a 33 year career.

Born October 31, 1951 in Blair, Tom grew up in Tekamah, graduating from Tekamah High in 1970. He graduated in 1974 from University of Nebraska-Lincoln with a B.S. in agriculture. He received his M.S. in agricultural engineering in 1976.

In 1980, he began his career with Nebraska Extension. Tom earned Nebraska Extension's annual award for outstanding service in 2007 and the Holling Family Award for Teaching Excellence in Extension in 2008.

His favorite saying for both work and personal relationships was, "They don't care what you know unless they know that you care." Among his fondest and most meaningful memories was the opportunity to build homes for people in Mexico.

International Scholar



Dr. Darrell Watts, a long time faculty member, passed away on January 10 at 80 years of age. He retired from BSE in 2001. Born in 1936 near Martha, Oklahoma, Darrell received his B.S. in agricultural engineering from Oklahoma State in 1960 and his M.S. in irrigation engineering from the University of California-Davis in 1962. After four years as an assistant professor of agricultural engineering

at Oregon State, Watts returned to Oklahoma State to help with the building of a College of Agriculture at Hailie Selassie University in Ethiopia.

In 1972, Darrell came to Nebraska to become an irrigation development specialist at the North Platte extension station. While there, he earned a Ph.D. in agricultural engineering from Utah State University with a dissertation on the modeling of nitrate leaching in the Nebraska Sandhills. In 1977, he began teaching, advising students, and conducting irrigation projects at Rogers Memorial Farm in Lincoln. During 24 years as a professor of irrigation engineering at UNL, he led numerous consulting trips on water management that took him to 37 countries, including Colombia, Chile, Russia, Morocco, Niger, Zaire, Brazil, and Argentina.

Throughout his career, Watts served the United States Agency for International Development (USAID) and, beginning



in 1982, was the agricultural engineering leader for a program in Morocco. There, he managed a project to develop a dryland research center on a three million-acre plot, turning a failing project into a successful one in five years. For that, Watts earned a UNL Distinguished Service Award in 1988. He became an honorary professor at the University of Concepción in Chile in 1997. He earned the USDA group honor award for excellence, MSEA project, and the ASAE Nebraska Section, Engineer of the Year in 1997, and received UNL research team award in 1998. Darrell was inducted into the BSE Hall of Fame in 2009.



Alum Heads Department in Chile

Octavio Lagos, Ph.D. 2008, first came to UNL as an undergraduate student worker for **Darrell Watts** in the MSEA project and returned for graduate studies. Dr. Lagos has been on the faculty at the University of Concepción in Chile in the Agricultural Engineering faculty since 2009. In 2013, he became Head of the Water Resources Department. His current teaching and research projects include: Irrigation

Engineering; Evapotranspiration Modeling and Measurements (Energy Balance, Eddy Covariance System, Bowen Ratio Energy Balance System, and Surface Renewal Systems); Measurement and Modeling of Surface Energy Balance Variables for Agricultural and Natural Surfaces; Geographic Information Systems in Water Resources; Remote Sensing in Water Resources.

After retiring, he continued working in many capacities at UNL and did consulting work internationally. Darrell is survived by his wife, Lois, and children, Sylvia and Joel. Memorials may be directed to the Pulmonary Fibrosis Foundation, University of Nebraska Foundation, or Region V services for the handicapped.



Study Abroad Panama

Janelle Adams

My education abroad experience in Panama exceeded my expectations in every way. Our group of 12 consisted of various majors and backgrounds; I was the only engineering student. At first, our differences were very apparent, but as the project progressed we learned each other's strengths and were able to work together efficiently as a team.

Half of our time was spent exploring Panama City, visiting tourist attractions, learning about the culture of Central America. Then we worked on a business-based project at a small teak tree farm near David, Panama. Our task was to find the best way to sell the farmer's trees and transition her land into an eco-tourism site. I had trouble finding the best fit with my engineering background, but as we began estimating the worth of her farm, my expertise came in handy. We needed to calculate the number of cubic meters of wood on her farm to come up with an estimate. Another student and I came up with two estimates for the teak trees. The marketing and international business majors focused on the eco-tourism side. What may have seemed like an eclectic mix of majors in the beginning, turned out to be the perfect dynamic to finish our project and impress our client.



Janelle Adams, BSEN junior, helping a teak tree farm become profitable.





A BSE senior design team works on a car for their capstone project. They are addressing issues to make Go Baby Go cars easier for the children to operate.

Go Baby Go Engineering Impacts Lives

Go Baby Go is an outreach project that involved the collaboration of 50 students from UNL College of Engineering and UNMC. In Oct. 2016, nine families that have children with mobility problems received renovated electric toy cars completed by the students. Go Baby Go has allowed students to help 17 families thus far, while discovering how their fields of study can impact lives.

"I was definitely crying a lot," said **Katie Watts**, a BSE graduate student. "You can see the tangible evidence of everything your work is doing."

Go Baby Go started at the University of Delaware and is designed to get children with Down Syndrome, spina bifida, cerebral palsy and other mobility-limiting conditions moving on their own. While Sandra Willet's senior students in UNMC's physical therapy program were excited to work on the project, they turned to the engineers to modify the electric cars. Last spring, Willet pitched the project to Watts, who was working with UNMC on a senior capstone project. Watts enlisted BSE professor **Jeffrey Woldstad** and members of Nebraska's student chapter of the Biomedical Engineering Society.

Woldstad, who specializes in whole-body ergonomics and rehabilitation engineering, said the biggest benefits of the collaboration are not tangible. "The multidisciplinary part—for engineers, it's being able to go and see what physical therapists do and then being actually able to build something for people to use right now—that's powerful. The hardest part of being an engineering student is the science and the math and the constant learning without ever seeing the end of what you're going to do. With this, they see the end."

In early August, Watts and two other students, joined a group of physical therapists—under the direction of Sam Logan of Oregon

State University—for the first Go Baby Go training build. Through grants from the Munroe-Meyer Guild and Nebraska-based engineering firm Olsson Associates, UNMC acquired eight cars and tools and materials for the conversions, including PVC pipes and plastic foam swim noodles. The car building took eight hours, including the introductory instruction. For the October event, the number of engineers increased to 20, including first-semester freshmen. Teams typically consisted of one engineer and four physical therapists.

One team of five BSE engineers worked on a "SpongeBob Square Pants" car as part of a year-long senior design capstone project. Woldstad said that team addressed many issues with the cars, including making steering and operating easier for the children. By 11 a.m., families started to arrive, and the children were introduced to their cars. Colleen Ogburn, of Bellevue, wiped away tears as she watched Zeke, her 15-month-old son with spina bifida, learn to push the button that moved his SpongeBob car down a hallway.

Moments like those helped convince Watts that engineering is the path for her future. "In my head, becoming a doctor was the natural way of helping people, so I had my eye on medical school. This was another opportunity to explore that engineering side." Watts decided not to apply to medical school. "Through interactions like this, it made me realize that in engineering you can still have that direct connection." She hopes to remain affiliated with Go Baby Go and that it continues. "Anytime you go to work at a business or go to a school, when you leave you want to leave something behind. Dr. Woldstad and Sandy and I have talked about the next steps, and it's about finding funding so it can be an organization that can continually do this. I want to be a part of that and want it to be set (at Nebraska) so it can keep going for years and years."

Women in Engineering and



Ruby M. Loper, the first woman to serve as a professional in Agricultural Engineering, was from Douglas, NE; a Lincoln High grad, she studied Architectural Engineering at UNL 1920-22, began as a draftsman in the Ag. Engineering Department in 1923, and served as Chief Draftsman 1924-1933 to design farm buildings. An Asst. Extension Engineer, 1934-1946, she earned her B.S. in 1946 and joined Cornell's Ag. Engineering faculty. Her 1937 *Farm Houses That Farm Families Want* was in *Agricultural Engineering*, forerunner of *Transactions of the ASABE*. A part of her early extension career was to survey farms for contours and terraces, a new practice at the time, to prevent soil erosion. Due to the absence of male farm labor during World War II, Ruby held extension programs to teach women to operate tractors. Ruby Loper pioneered the involvement of women in engineering and was inducted into the BSE Hall of Fame, 2011.



Kitt Farrell-Poe, Ph.D., was the first woman to earn a B.S. in Ag. Engineering at UNL (1979). She now heads the University of Arizona's Agricultural & Biosystems Engineering Dept., where she is a water quality specialist and professor. Her M.S. and Ph.D. degrees are from Purdue. She worked as an engineering specialist at UNL, 1980-82.



Angela K. Pannier, Ph.D., Biomedical Engineer, Associate Professor, William E. Brooks Engineering Leadership Fellow, with Albert Nguyen, Ph.D. student, examines alginate hydrogels for tissue engineering applications.



Nicole M. Iverson, Ph.D., Assistant Professor, Biomedical Nonotechnology Specialist, examines carbon nanotube sensors to investigate inflammatory disease progression, starting with melanoma, using her lab's near infrared hyperspectral microscope, with student Eric Hofferber.



Jennifer Keshwani, Ph.D., Assistant Professor, Science Literacy Specialist, teaching/extension joint appointment, promotes science and engineering education in formal and informal settings using topics from a range of STEM areas including biomedical engineering, agricultural systems, bioenergy, and wearable technologies.



Sara Plautz, Research Technician III, Pannier Lab manager, conducts research to understand the cell response to nonviral vectors through cell priming, manages and completes client contracted cell growth, and mentors graduate and undergraduate students.



Rhonda M. Brand, Ph.D., was the first woman faculty member in BSE at UNL as an Associate Professor from 1997-2002. She is now at the University of Pittsburgh's Department of Medicine.



Amy Schmidt, Ph.D., P.E., Assistant Professor, BSE & Animal Science, holds a microbiological plate with pathogenic *E. coli* (*E. coli* O26:H11) that was transformed with plasmid pAK1-lux to generate photons. The project studied the ability of tall fescue to internalize *E. coli* O26:H11 and its role in deconjugation of steroid hormones in cattle urine. A photonic imaging system generated the image showing *E. coli* growth on the plate; it originated from tall fescue plant tissue sample collected after transformed *E. coli* was applied to soil where the fescue grew.



Tiffany Messer, Ph.D., Assistant Professor, is a Water Quality Engineer working at the intersection of ag engineering, ecology, and chemistry. She focuses on fate and transport of nutrients and emerging contaminants, innovative water quality sensor technologies, stable isotope enrichments, and biogeochemical processes, primarily in agroecosystems.



Rebecca Wachs, Ph.D., Assistant Professor, Orthopedics and Neural Engineering Lab Director. Her research includes developing novel interventions to treat low back pain.



Crystal Powers, Extension Engineer, works with the interaction between livestock and agroecosystems. Current Project Coordinator for Animal Agriculture in a Changing Climate national Extension project where her focus has been using science-based communication strategies to help Extension professionals. She has been involved in the development and application of the Nebraska Odor Footprint Tool and other air and water quality technologies.

... from Around the World

 **Sibel Irmak**, Ph.D., Research Associate Professor, B.S., M.S., Ph.D., Chemistry, Cukurova University, Adana/**Turkey**, focuses on the development of value-added products including biofuels, bioproducts, and industrially important chemicals (such as hydrogen, furfural, dicarboxylic acids, and others) from biomass; joined BSE (IAPC) from Cukurova University, Turkey (prestigious

in Europe); she started her academic career through an international award given to successful young women in science by International Federation of University Women (Geneva, Switzerland) and was tenured faculty in Chemistry in Turkey.

 **Yeyin Shi**, Ph.D., Assistant Professor B.S., Mechanical Engineering, Nanjing Forestry University, **China**, M.S. & Ph.D., Biosystems & Agricultural Engineering, Oklahoma State, has interest in ag information systems, with recent research in UAV application for agronomy and high-throughput field-based phenotyping.

 **Juhyon (Julia) Kang**, Ph.D., Post-doc Research Associate, B.S., Energy Resources Engineering, Seoul National University, **South Korea**, recently joined BSE (IAPC). She has researched microalgae to mitigate gas and water pollution, especially generated from agricultural practices. She now researches lignin degradation and oxidation geared toward production of valuable smaller molecules for many industrial applications.

 **Divya Ramchandran**, Ph.D., Post-doc Research Associate, B.E., Biotechnology, Manipal Institute of Technology, **India**, M.S., Environmental Engineering & Ph.D., Agricultural & Biological Engineering, Illinois, recently joined BSE (IAPC). Her research interest is in bioprocessing; she intends to pursue a career in applied research for the advancement of biorenewables, currently working on utilizing corn fiber to obtain value added industrial products.

 **Juliet Okuom**
Assistant Business Manager
Filley Hall Business Center
B.S., Accounting, Daystar University, **Kenya**
M.B.A., Applied Business, Waynesburg, PA

Amazing International Talent



Roberto Lenton, Ph.D.
BSE Professor, Robert B. Daugherty Chair, Global Water for Food Institute
B.S., Civil Engineering, University of Buenos Aires, **Argentina**
M.S. & Ph.D., Hydrology and Water Resource Systems, MIT



Theo Lioutas, Ph.D.
Research Professor
B.S., Chemistry, University of Athens, **Greece**
M.S., Agricultural Engineering & Ph.D., Food Chemistry and Food Science, University of Illinois



Humeshkar Nemala, Ph.D.
Research Assistant Professor/Ag. Data Scientist
B.S. & M.S., Physics, Loyola College, **India**
M.Tech, Computational Techniques, University of Hyderabad, India
M.S., Physics, University of Kentucky
Ph.D., Physics, Wayne State University, MI



Geng Bai, Ph.D.
Post-doc Research Assistant, B.E., Hydraulic & Hydropower Engineering, M.E., Agricultural Soil & Water Engineering, China Agricultural University, **China**
Ph.D., Environmental Science & Technology, Niigata University, Japan



Christopher Neale, Ph.D.
Water for Food Institute, Director of Research
B.S., Civil Engineering, Escola de Engenharia Mauá, São Caetano do Sul, São Paulo, **Brazil**
M.S. & Ph.D., Agricultural Engineering, Colorado State



Yiqi Yang, Ph.D.
Charles Bessey Professor; Textiles and BSE B.E. & M.E., Textile Chemical Engineering, Donghua University, **China**
Ph.D., Textile Science, Purdue

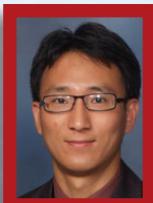


Lameck O. Odhiambo, Ph.D.
Research Associate Professor
B.S., Agriculture, University of Nairobi, **Kenya**
M.S., Soil and Water Engineering, Seoul National University, South Korea
Ph.D., Irrigation Engineering, and Management, Asian Institute of Technology (AIT), Thailand

Our International Scholars...

Of 61 BSE graduate scholars, 26 come from other nations. Shown here with their advisors who are international scholars.

Advisors not shown are named with their students.



★ Dr. Yufeng Ge (B.S. & M.S. Mechanical Engineering, Nanjing Forestry University, China; Ph.D. Biological & Agricultural Engineering, Texas A & M) advises these scholars:



Suresh Thapa, Nepal
B.S. Mechanical Engineering, Tribhuwan University, Nepal
Research: "Multi-wavelength laser scanning instrument for plant phenotyping"



Piyush Pandey, Nepal
B.E. Mechanical Engineering, Tribhuvan University, Nepal
Research: high throughput chemical phenotyping of plants using digital images.



Nuwan Wijewardane, Sri Lanka
B.S. & M.S. Agricultural Engineering University of Peradeniya, Sri Lanka
M.S. Biosystems Engineering UNL
Research: "Design and development of a VNIR soil penetrometer for high resolution vertical soil mapping"



Wenan Yuan, China
B.S. Agronomy, China Agricultural University, China
B.S. Soil and Crop Sciences, Colorado State University
Research: "Application of Sensor-based System on High Throughput Field Phenotyping"



Abbas Atefi, Iran
B.S. Agricultural Engineering, Chamran University of Ahvaz; M.S. Agricultural Engineering Shiraz University, Iran
Research: "Robotic technologies for in vivo plant phenotypic sensing"



★ Dr. Santosh Pitla (B.S. Mechanical Engineering, Osmania University, India; M.S. & Ph.D. Biosystems & Agricultural Engineering, Kentucky) also advises Abbas Atefi.



★ Dr. Suat Irmak (B.E. University of Cukurova, Turkey & M.E. University of Mediterranean, Turkey, Agricultural Structures & Irrigation Engineering; Ph.D. Agricultural & Biological Engineering, Florida) advises these scholars:



Meetpal Kukal, India
B.Tech. Agricultural Engineering, Punjab Agricultural University, India; M.S. AGEN & BSE, UNL
Research: Measurement of Dynamics of Coupled Radiation, Water and Nutrient Use Efficiency for Subsurface Drip-irrigated Maize, Soybean, Winter Wheat and Sorghum.



Ali Mohammed, Iraq
B.S. Agriculture Mechanization University of Mosul-Iraq; M.S. Mechanized Systems, UNL
Research: "Maize Yield Response to Different Irrigation Methods, Regimes and Various Timing Nitrogen Applications at South-central Nebraska"



Rupinder Kaur Sandhu, India
B. Tech. Agricultural Engineering, Punjab Agricultural University, Ludhiana, India; M.S. AGEN & BSE, UNL
Research: Evaluation of different crop models for their performance to simulate field-measured variables like soil water status, yield, water use, irrigation requirement, water use efficiency as well as crop growth and development variables for major crops



Kiran Sharma, India
B.Tech. Agricultural Engineering, Punjab Agricultural University, India.
Research: "Soil moisture sensor performance and impacts on water balance estimates in sand and silt loam soils of Nebraska"



Vasudha Sharma, India
B. Tech. Agricultural Engineering, Punjab Agricultural University, India
M.S. AGEN & BSE, UNL
Research: Variable Rate Irrigation Fundamentals: Impact of Variable Rate Irrigation and Fertigation on Maize Yield, Evapotranspiration, and Water Productivity



Sahil Sharma, India
B.S. Punjab Agricultural University, India
Advisors: Dr. Kranz/Dr. Irmak



Mengxing Li, China
B.S. Food Science & Technology, Henan University of Technology, China; M.S. Biosystems & Ag Engineering, Oklahoma State
Research on cost effective microbial conversion to transform hay into bioplastic.
Advisor: Dr. Wilkins

...amazing talent from around the world



★

Dr. Jeyam Subbiah, P.E. (B.S. Agricultural Engineering, Tamil Nadu University, **India**; M.S. University of Manitoba, & Ph.D. Oklahoma State, Biosystems Engineering,) advises these scholars:



Mumba Mwape, **Zambia**

B.S. Agricultural Sciences, University of Zambia
Research designing suitable community irrigation systems in 2 agro-ecological regions of Zambia.
Advisor: Dr. Heeren



Rami Ziara, **Palestine**

B.S. Civil Engineering, Islamic University-Gaza, Palestine
M.S. Environmental Engineering, UNL
Research: Cattle Slaughterhouse Wastewater Characterization, Treatment and Energy Recovery using Bioelectrochemical Systems



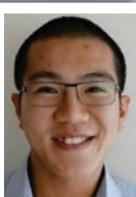
Sandeep Bhatti, **India**

B.S. Agricultural Engineering, Punjab Agricultural University, India
Research focusing on variable rate irrigation management, incorporating data from unmanned aircraft and satellites.
Advisor: Dr. Heeren



Long Chen, **China**

B.S. & M.S. Northwest Agriculture & Forestry University, China.
Research: Treatment Protocol of Radio Frequency Pasteurization for Improving the Safety of Low-moisture Foods



Tsz Him Lo, **Hong Kong**

B.S. Biological Engineering, Cornell University, Ithaca, NY; M.S. BSE, UNL
Research: "Sensor-Based Site-Specific Management of Irrigation and Fertilizer in Production-Scale Fields"
Advisors: Dr. Rudnick/Dr. Shaver/Dr. Heeren



Shaobin Li, **China**

B.S. Chemical Engineering, Zhengzhou University, China
Research: "Environmental life cycle assessment of beef packing industry in U.S."



Jasreman Singh, **India**

B.Tech. Agricultural Engineering, Punjab Agricultural University, India
Research in field and lab performance analysis of electromagnetic soil water sensors in a loam soil.
Advisor: Dr. Rudnick



★

Dr. Francisco Munoz-Arriola (B.S. & M.S. Oceanography, Universidad Autonoma de Baja California, **Mexico**; Ph.D. Civil & Environmental Engineering, Duke) advises these scholars:



Naisargi Dave, **India**

B.E. Civil Engineering, SAL Institute of Technology and Engineering Research, Gujarat Technological University, India
Research: Quantifying Cost-Efficiency of Streambank Stabilization Practices on Cedar River, NE
Advisor: Dr. Mittelstet



Alessandro Amaranto, **Italy**

M.S. Environmental & Geomatic Engineering, Politecnico di Milano, Italy
Research: "Data Science and Information Technology to Improve Predictability of Water Stress and Support Water Allocation in Agriculture"



Olufemi Abimbola, **Nigeria**

B.S. & M.S. Ag & Environmental Engineering, University of Ibadan, Nigeria
M.S. Water Science & Engineering, UNESCO-IHE Institute for Water Education, The Netherlands
Research: "Spatial Variability of Streambed Hydraulic Conductivity across Multiple Stream Orders"
Advisor: Dr. Mittelstet



Juan Jaimes-Correa, **Colombia**

B.S. Environmental Engineering, University of El Valle, Colombia
M.S. Natural Resources, UNL
Research: "Watershed Response and Emerging Contaminants Occurrence under Extreme Precipitation and Drought Conditions in Agricultural Watersheds"



Mohsen Hozan, **Iran**

B.S. Biomedical Engineering, Amirkabir University of Technology, Iran
Research: Biomedical Signal Processing and Computational Neuroscience
Advisors: Dr. Bashford/Dr. Barlow



Aria Tarudji, **Indonesia**

B.S. Biochemistry& Chemistry, Washington Research: "Development of multifunctional nanoparticles for targeting and imaging of traumatic brain injury"
Advisor: Dr. Kievit



Mohammed Alwatban, **Saudi Arabia**

B.S. Biomedical Technology, King Saud University, Saudi Arabia
M.S. Biomedical Engineering, Wright State, Ohio
Research: "Altered Cerebrovascular Reactivity in Preclinical and Symptomatic Alzheimer's Disease: A Pilot Study Using Transcranial Doppler"
Advisor: Dr. Bashford



Water and Food Security Conference

The 2017 Water for Food Global Conference, organized by the Robert B. Daugherty Water for Food Global Institute at the University of Nebraska, will be April 10-12 at Nebraska Innovation Campus in Lincoln. Conference details, including how to register, are available at <http://waterforfood.nebraska.edu/2017wfc>.

The 2017 Water for Food Global Conference is a North American Regional Event for the 8th World Water Forum, the world's largest water-related forum organized by the World Water Council. It will bring together experts from around the world to explore "Water for Food Security: From Local Lessons to Global Impacts," a theme inspired by the notion that global breakthroughs come from local action.

Speakers from academia, nonprofit organizations, government agencies and private industry will share best practices and advances in science, technology and policy that are helping to achieve greater food security with less pressure on scarce water resources. The conference includes collaborative sessions developed with key partners of the Daugherty Water for Food Global Institute, including the International Water Management Institute, the United States Department of Agriculture, International Food Policy Institute, and The World Bank, among others.

The Robert B. Daugherty Water for Food Global Institute at the University of Nebraska was founded in 2010 by the Robert B. Daugherty Foundation to address the global challenge of achieving food security with less stress on water resources through improved water management in agricultural and food systems. They are committed to ensuring a water and food secure world while maintaining the use of water for other human and environmental needs. Learn more at waterforfood.nebraska.edu.

UNESCO-IHE Research for Zambia



Mumba Mwape, from Zambia, is passionate about improving the livelihood of small scale farmers there. After her B.A. in Agriculture Sciences, University of Zambia, 2010, she was employed by the Government of the Republic of Zambia. In 2013, she was posted to Zambia's highest ag research institute, Mt. Makulu Central Research Station, as a Research Officer in the Soil and Water Management Division. She investigates ways to improve soil physical parameters to increase productivity and production, her favorite being irrigation.

In 2015, her government awarded her a full scholarship through the Agricultural Productivity Program for Southern Africa (APPSA) to pursue a double M.S. degree in Advanced Water Management for Food Production offered by UNESCO-IHE, Delft, The Netherlands, and UNL's BSE Department. The cost of irrigation equipment in Zambia makes it impossible for small scale farmers to utilize. To find less costly and sustainable irrigation for small scale farmers, Mumba's research focuses on designing community irrigation systems in two areas (Masaiti-Mpongwe and Samfya-Lunga) found in agro-ecological region III of Zambia. She enjoys taking time off to take walks with her husband and daughter.



Yufeng Ge's Study on Apogee Website

Yufeng Ge and his research team conducted a study spearheaded by **Geng Bai** that was featured on Apogee Instruments' website. The field phenotyping multi-sensor system developed in Yufeng's group was successfully tested over 240 plots of wheat and 120 plots of soybean crop using a manual stop-measure-go data collection method. The study determined that final grain yield of soybean is strongly correlated with all six sensor base traits and suggested the usefulness of the sensor system in plant breeding.

<http://www.apogeeinstruments.com/high-throughput-field-phenotyping-multi-sensor-system/>



Team members watch their car speed down the ramp.



After the distance competition, teams race to eat the car.



13th Incredible Edible Vehicle Design Competition

This was the 13th year for the Incredible Edible Vehicle Design Competition where students in Introduction to Biological Systems Engineering and Introduction to Agricultural Engineering create a vehicle made strictly from edible components. Teams were judged on distance traveled, poster creativity, calorie count, and

overall design. Twenty-two vehicles competed as the crowd, comprised of faculty, students, alumni and engineering firm representatives, looked on. **Dr. Nicole Iverson** was the event announcer, and TA's **Paulina Guzek**, **Colton Rathman**, and **Brett Whorley** (pictured below right) assisted with the event.



First Place Overall: Nick Boehler,
Michael Brown, Olivia Bures



Lindhorst Overcomes Challenges to Cross the Stage

As reported on 10/11 Now, **Caleb Lindhorst** overcame major challenges to walk across the stage Dec. 17 to receive his B.S. in Agricultural Engineering. The 23-year-old had to work harder than most students to earn his diploma. He was in a roll-over crash, where he was ejected from the back seat of the vehicle in Dec. 2013; he wasn't wearing a seat belt, and he sustained a traumatic brain injury and was in a coma for weeks. He had a 10% chance of waking up.

"While I was in this dream, I kept thinking it's got to quit, it's got to quit, it's got to quit, I got to wake up, otherwise I'm going to miss Christmas," he said.

"I think for all of us it was a really tough Christmas that year," Professor **Roger Hoy** said. "I couldn't really stay away from him. I was thinking you know, how did such a terrible thing happen to such a nice guy."

But Caleb defied the odds and woke up; still, therapists and doctors told him he may never walk, drive or return to college. "I'm naturally a competitor and when they said I couldn't do it, I'm like I'm going to prove you wrong just because I can," he said. That's when Dr. Hoy started visiting Lindhorst twice a week, teaching him an engineering course.

After a year of therapy, Caleb returned to UNL as a full-time student. While he was back at school, he credits best friends and classmates **Luke Prosser** and **Micah Bolin** with his success, "If it wasn't for them I would not be anywhere because they believed in me, they fought for me, they did everything for me. I hate to say it, but I just kind of went along for the ride." They provided his transportation and did homework with him; he wasn't able to write, so they put down his words and formulas. He also credits his family for their support.

Caleb is going for his Master's in Agricultural Engineering. **Dr. Santosh Pitla** is his advisor. While Caleb continues to work on some mobility issues, he has been able to have accommodations that contribute to his success, and he is now able to drive.





Paul Jasa (center in red) instructs NRCS employees in conservation planning.

Conservation Boot Camp

In 2016, **Paul Jasa** instructed at six sessions of the Natural resource Conservation Service (NRCS) Conservation Boot Camp, a partnership between the NRCS and the National Association of Conservation Districts. Attendees used NRCS field employee training materials on guiding decision makers or landowners through the conservation planning process. Instructors from across the U.S. explained tools and assessments, sharing their conservation planning expertise with NRCS and Conservation District employees also from across the U.S. and Territories. At UNL's no-till research farm, Rogers Memorial Farm, Jasa demonstrated erosion runoff with the rainfall simulator and used long term tillage system comparison plots to give an exciting presentation about soil health.



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NRCS participants measuring soil properties.



Erosion, infiltration, and runoff demonstration.



Drones Survey Wetland Habitats



BSE's Wayne Woldt and Zhenghong Tang, College of Architecture professor of community and regional planning, are turning to the air to help monitor wetland habitat conditions. They are developing a methodology to use unmanned aircraft systems (UAS) to conduct dynamic monitoring and precise assessments of playa wetland habitats through a \$203,220 Environmental Protection Agency award. Focus areas include hydrological conditions, vegetation and energy levels, and wildlife usage in the Nebraska Rainwater Basin. Surveying the public waterfowl production and wildlife management areas across the basin will require multiple trips for data collection during spring and fall migratory seasons.

During the drone flights, the team will use multispectral sensors for detection of soil moisture levels and mapping of wetland inundation during spring migration season; thermal imaging cameras and oblique photogrammetry for evaluation of wildlife use and its distribution on playa wetlands; and 3D imagery for surveys of plant community conditions, estimations of energy availability and assessments of vegetation management effectiveness. Their method will provide improved imaging, greater resolution and detail, in a cost-efficient, timely and flexible manner. The new surveying tools and applicable protocols will offer wetland managers a greater understanding of wetland spring inundation conditions. If effective, the methodology can be replicated elsewhere and allow wildlife managers to advance conservation efforts.

BSE Alum Wins People's Choice Award in Rural Entrepreneurship

A.J. Stauffer (MSYM 2011) of Seward is the co-founder of Levrack, a movable shelf unit that mounts on sliders on a pallet rack, allowing shelves to fit more into a smaller space. *Nebraska Farmer*, and *Lincoln Journal/Star* reported, the Levrack team won the People's Choice award in the American Farm Bureau's Rural Entrepreneurship Challenge for their design, which they unveiled for the first time at Husker Harvest Days in 2016. Founded in the winter of 2015, the Levrack concept has grown to a startup company with a five-state footprint.

The idea was born in Ryan's family's farm shop, which had been lost to a tornado two years past. Their new location didn't have a good place for parts storage. Their original plan "was so customized. It would have involved a team of engineers with blueprints and pricing quotes," A.J. said. "That was a learning experience. No one had packaged mobile storage in a way that's more convenient." They realized there was a need to fill in the market, and Levrack was born.



A.J. Stauffer (left) and cousin Ryan Stauffer showcase their Levrack shelf unit.

They started out fabricating the Levrack entirely by themselves, then began to hire other fabrication shops to pre-assemble them to expedite the process. "It was huge for us early on, because we didn't have to take drawings to a fabrication shop. We drew it up here and went out in our own shop and made it with our own tools," A.J. says. "That's great for a prototype but not practical for high volume. We maintained the vertical storage space . . . our system takes 24 feet of shelving in 12 feet and you can still keep your overhead storage. It's also completely modular—you can take it and add a toolbox and different shelves." So far, they've seen interest at the farm shop and garage level, as well as from seed and chemical dealers—and even the occasional school. They're currently shipping them to five states.

Awards♦Honors♦Recognition

Research Excellence



Jeyamkondan Subbiah, professor of food engineering, biological systems engineering and food science and technology, has earned the Nebraska Chapter of Gamma Sigma Delta Excellence in Research Award. The award was presented at Gamma Sigma Delta's annual initiation and awards banquet in January.



Joe Luck



Roger Hoy



John Hay

Joe Luck was awarded ASABE 2017 Ag Equipment Technology Conference Most Valuable Person. He was also recently promoted to Associate Professor with tenure.

Roger Hoy is a recipient of this year's Holling Family Senior Faculty Teaching Excellent Award from CASNR.

John Hay was promoted and will be an Extension Educator.



Parents' Recognition Awards

Six BSE faculty earned annual UNL Parents' Recognition honors through nominations made by their students' parents. **Nicole Iverson** (left) was a recipient for the first year, **Roger Hoy**, **Deepak Keshwani**, (center left) and **Greg Bashford** (center right) are five-year recipients, and **Jeyam Subbiah** (right) and **Johathan Heithold** have been recognized twice.

Paul Jasa: No-Till Legend



Paul Jasa was recognized at the 25th Annual National No-Tillage Conference in St. Louis as one of 25 "No-Till Legends" by the editors of *No-Till Farmer*. He was one of only three university specialists recognized out of 25 experts. Paul will be featured in the upcoming publication *From Maverick to Mainstream: A History of No-Till Farming*: <https://www.no-tillfarmer.com/articles/6396-no-till-farmer-honors-25-individuals-for-contribution-to-no-till>



UN World Water Day

Roberto Lenton was a panelist at the United Nations' World Water Day, March 22. He said, "The dialogue will focus on ways to improve the integration and coordination of the UN's work in the water area." Participants included Peter Thomson, President of the UN General Assembly, Amina Mohammed, the UN Deputy Secretary General, Sanjaasuren Oyuun, the Chair of the Global Water Partnership, and Olcay Ünver, the Deputy Director of the FAO Land and Water Division.



Congratulations to **Michael Van Liew** for his new position at the Nebraska Department of Environmental Quality. He will review engineering of livestock manure nutrient management plans to ensure state and federal regulatory requirements.

In Dec. 2016, at the IANR Annual Awards Luncheon, two BSE staff were nominated for the Outstanding Employee Award. **Amber Patterson** was nominated by Amy Schmidt, and **Juliet Okuom** was nominated by Suat Irmak.



Amber Patterson



Juliet Okuom

What's New?

Update your profile at:
bse.unl.edu
under the *Alumni* tab

What's News?

See *About the Department*
for news archives and
past issues of *BSE Magazine*

bse.unl.edu



Riley Becomes AIMBE Fellow

Mark Riley, BSE Department head, was inducted into the College of Fellows of the American Institute for Medical and Biological Engineering (AIMBE) that is comprised

of the top two percent of medical and biological engineers in the country. Riley was nominated, reviewed and elected by peers and members of the College of Fellows for outstanding contributions to biological engineering through development of noninvasive biological measurements and leadership in the profession. The induction ceremony was March 20 during AIMBE's annual meeting, National Academy of Sciences Great Hall, Washington, D.C. He and 145 colleagues make up the AIMBE College of Fellows Class of 2017. Riley is the fourth individual from the University of Nebraska to be in the AIMBE College of Fellows. **Ron Yoder**, Associate Vice Chancellor, Institute of Agriculture and Natural Resources, has also received this honor. Since 1991, AIMBE's College of Fellows has lead the way for technological growth and advancement in medical and biological engineering in order to enhance and extend the lives of people the world over.



Irmak Receives Best Paper Award

Dr. Suat Irmak, Harold W. Eberhard Distinguished Professor, will receive the 2017 Best Paper Award from the Environmental & Water Resources Institute at the World Environmental & Water Resources Congress, May, 2017, in Sacramento, for two technical papers:

"Interannual Variation in Long-Term Center-Pivot Irrigated Evapotranspiration and Various Water Productivity Response Indices. I: Grain Yield, Actual and Basal Evapotranspiration, Irrigation-Yield Production Functions, Evapotranspiration-Yield Production Functions, and Yield Response Factor"

"Interannual Variation in Long-Term Center-Pivot Irrigated Evapotranspiration and Various Water Productivity Response Indices. II: Irrigation Water Use Efficiency, Crop WUE, Evapotranspiration WUE, Irrigation-Evapotranspiration Water Use Efficiency, and Precipitation Use Efficiency"

CASNR Fellow

Angela Pannier received the 2016 Fellow of the College of Agricultural Sciences and Natural Resources Award in recognition of the exemplary contribution provided to scholarship in research for undergraduate students.



ASABE Honors Alums

Bill Stout, BSE Alum and Hall of Fame conferee, will receive the Lalit and Aruna Verma Award for Excellence in Global Engagement from ASABE. Bill received his B.S. in Agricultural Engineering. He served as President of the International Commission of Agricultural and Biosystems Engineering (CIGR) 1999-2000. More information about CIGR can be found on <http://www.cigr.org/>

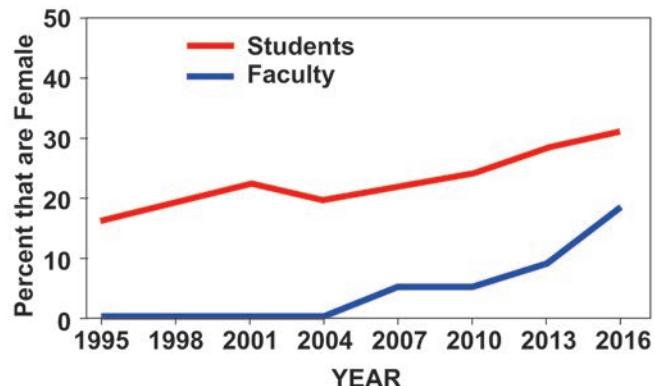


Noel Menard (AGEN 2013) is one of five individuals selected to the 2017 Class of New Faces of ASABE-Professionals, awarded by ASABE Iowa Section. She is a Product Test & Evaluation Engineer at John Deere Waterloo Works. Her job is to excel at breaking things. "I try to break things so that the customers that purchase our machines don't," she explains. Menard sees herself as the voice of the customer, ensuring products will work when and how they are needed in the field. Interaction with the customers is one of the things she loves about her work. "By far the best part of my job is being able to work with our customers and my coworkers to deliver the best products that we can. Every day is different," she says, "and often presents problems for which there are no easy answers." Her enthusiasm for her work spills over to volunteer activities, particularly in STEM outreach, through which she promotes engineering careers and offers support to other women in engineering. Her work with a mentoring program has been particularly rewarding, she reports, "It's great to be able to be a positive influence on a young person's life and give them the courage and reassurance that they need to succeed." Noel worked as a student at the Nebraska Tractor Test Lab and was active in UNL Quarter Scale Team and ASABE Student Branch.



Most Women Ever in BSE!

The number of women students enrolled in BSE and women on the faculty continues to grow. In 1995 there were 30 women BSEN majors; today there are 118! That's 49% of the total BSEN majors. We had 12 women in Ag Engineering last year. Women now make up 20% of the faculty members, with 9 women on the faculty and in Extension.



BSE Ambassadors Appointed

In addition to Deidre and Paulina's continuing work as student ambassadors, we are pleased to welcome three new student ambassadors to the team this semester: Lauren Hunt, Rebekah DeFusco, and Jordan Bothern.

Lauren Hunt is a BSE junior minoring in Biomedical Engineering and French. Originally from Overland Park, Kansas, she says that since coming to Nebraska her interest in research has grown, especially in the areas of neuroscience, pain management, and orthopedics (specifically in pharmaceuticals for mental illnesses and pain, and the role of genetics in the uptake of these drugs). She participated in the Summer Undergraduate Research Program (SURP) at UNMC, gaining knowledge of neuroscience, MATLAB, and problem solving. She shadowed a rheumatologist, a pulmonologist, and a perfusionist during a swine open-heart surgery. She loves to travel and explore new places and has studied abroad in southern France. "As the outreach chair on the Engineering Student Advisory Board and Society of Women Engineers, I love networking with other engineering majors to create unity within the college," she reports. "I've always had a passion for helping people and seeing the fruits of my labor ultimately improve the lives of others."

Rebekah DeFusco is a BSE junior with an emphasis in environmental and water resources engineering. She is from Lincoln, holds officer positions in the Society of Women Engineers and American Society of Agricultural and Biological Engineering (ASABE), is involved with the UNL Navigators, and was initiated into Tau Beta Pi last semester. This past summer, she studied abroad in Lille, France, taking classes in engineering project management and current practices in renewable energy. She reports, "Whenever I get the chance, I love volunteering at the Lincoln Children's Museum, and once a year I am Princess Merida for their Super Hero Day!"



Jordan Bothern is a MSYM sophomore with a passion for agriculture. She works at the Nebraska Tractor Test Lab and is a member of the UNL

Quarterscale Team and ASABE. She says her sorority, "Delta Gamma provides me connections to women across an eclectic mix of majors all of whom have taught me something about our campus, the community or even their experiences around the world." She is involved with Nebraska's agriculture boards (Wheat Board, Corn Board, Ethanol Board, Corn Growers, Cattlemen, etc.) to promote agricultural awareness across the state and "foster open relationships within the community that allow for a respectful inclusion of all opinions on agriculture." This summer, she will intern for Cargill at their portage location in Burns Harbor, Indiana to learn about grain elevators and how they market and export grain by way of barges. She chose to come to UNL to carry on a tradition for generations in her family and plans to work in Nebraska. She reports, "Whether I am putting in hours studying, learning about new research and resources in the agricultural industry, going hunting on the land my family homesteaded generations ago, attending Husker games, watching the sunset, or even driving a combine for the first time in a corn field, Nebraska has endless opportunities for me, and I look forward to seeing where my journey continues."

As part of Nebraska by Heart project, celebrating Nebraska's sesquicentennial, sculptures are being displayed on UNL campuses.

"Together" by Becky Lamb, placed in front of Chase Hall, includes Helen Keller's quote, "Together we can do so much." Lamb says her sculpture is a tribute to people who "love to take things apart, examine how they work, and put them back together again..."

Their community and support of each other has created a strong bond that will never be broken. My family appreciates the experience and knowledge of each other. They depend on it; much like Nebraska. We are surrounded by incredible talent, knowledge, strength and compassion. We come together and make big things happen." Individual patrons are noted on the base of the sculpture, and the project, sponsored by Boys Hope Girls Hope and the Sadie Dog Fund, features 81 fiberglass sculptures that reflect imagery related to the Cornhusker State.



DEAN'S LIST December 2016

AGEN
 Nicholas Boehler
 Micah Bolin
 Michael Brown
 Olivia Bures
 Rylan Dvorak
 Nicholas Engle
 Isaac Frerichs
 John Freudenburg
 Mark Freyhof
 Max Hjermstad
 Luke Johnson
 Caleb Lindhorst
 Anthony Meusch
 Joshua Murman
 Kevin Sousek
 Aaron Steckly
 Bennett Turner
 Amanda Van Sant
 Seth Wetovich

BSEN
 Janelle Adams
 Ellie Ahlquist
 Tafla Al Ruzaiqi
 Freshta Baher
 Victoria Bart
 Joshua Bauer
 Emily Bender
 Conner Beyersdorf
 Kevin Birdsall
 Clayton Blagburn
 Connor Blankenau
 Nicholas Bohlim
 Matthew Boren
 Tessa Bouley
 Merrill Brady
 Kenneth Bristol
 Megan Brohman
 Bryan Brunson
 Madison Burger
 Jocelyn Carter
 Brinson Chapp
 Connor Christensen
 Hannah Christian
 Blake Coen
 Eric Davis
 Rebekah DeFusco
 Erica Dolph
 Drew Dudley
 Katherine Dudley

Bailey Eddy
 Collin Erickson
 Ben Everswick
 David Forsyth
 Mitchell Frischmeyer
 Jessica Glas
 Megan Gren
 Paulina Guzek
 Lukas Hall
 Brandon Haney
 Samuel Hansen
 Blake Hass
 Kari Heck
 Erica Hedrick
 Sarah Heindl
 Austin Helmink
 Bailey Helmink
 Philion Hoff
 Cody Houdeheldt
 Alexandra Hruby
 Lauren Hunt
 Baron Huntwork
 Neng Huynh
 Grant Jensen
 Josiah Johnson
 MacKenzi Johnson
 Emilie Johnson
 Christian Keller
 Sarah Kenny
 Elisabeth Lahners
 Julia Lindgren
 Conner Lunn
 Colton Lyons
 Alexander Magsam
 Spencer Maguire
 Katie Meiergerd
 Jacob Meyer
 Andrew Minarick
 Mitchel Misfeldt
 Michael Moeller
 Troy Nelson
 Samantha Nelson
 Kayla Ney
 Matthea Niemoth
 Marissa Nitz
 Breck Ostrander
 Megan Pamperin
 Meaghan Pecha
 Anna Petrow
 Logan Piening
 Allyson Pietrok

Allison Porter
 Ravi Raghani
 Kevin Real
 Kelsey Reeves
 Nathan Rice
 Megan Ruckman
 Deidre Sandall
 Shilan Schechter
 Nicole Schumacher
 Nicole Schwery
 Parker Segal
 Alex Seggerman
 Nicholas Seier
 John Shook
 Brianna Smith
 Dillon Soukup
 Arianna Spellman
 Joseph Stapleton
 Loren Steinman
 Erin Stevens
 Noah Streich
 Emily Threlkill
 Kevin Vakilzadian
 Luisa Valencia
 Jordan Verplank
 Benjamin Wankum
 Brett Whorley
 Jace Wieseler
 Elise Wordekemper
 Dillon Wordekemper
 Derek Wright
 Maranatha Zelt
 Carly Zimmer
 Kristina Zvolanek

MSYM
 Benjamin Barelman
 Mason Buckendahl
 Turner Hagen
 Jared Hendricks
 Gage Hoegermeyer
 Michaela Horn
 Jonathon Jahnke
 Seth Lackas
 Jonathan LeCuyer
 Troy McDonald
 Jared Muhlbach
 Austin Preister
 Seth Schumacher
 Parker Wallin
 Samuel Wildman

GRADUATION

DECEMBER 2016

AGEN
 Micah Bolin
 Joshua Krueger
 Caleb Lindhorst

BSEN

Ellie Ahlquist
 Paula Sandoval Borda
 Brinson Chapp
 Christopher Davis
 Drew Dudley
 Collin Erickson
 Margaret Gilseth
 Mary Hernandez
 Cody Houdeheldt
 Zachary Janecek
 Jacob Meyer
 Michael Moeller
 Samantha Nelson
 Nathan Rice (*with distinction*)
 Nicole Schwery
 Dillon Soukup

MSYM
 Kevin Bahr
 Adam Bannister
 Seth Hampton
 Roger Heusinkvelt II
 Cody McDowell
 Kyle Smith
 Michael Thurber
 Matthew Treadway
 Ryan Tvrda

M.S.
 Brian Barnes
 Scott Speicher
 Jared Werner

Ph.D.
 Hyuntaek Oh

AUGUST 2016 *

M.S.
 Shane Forney
 Taylor Laughlin
 Amy Mantz
 Maria Ana Mulet Jalil
 James Roebert
 Max Twedt
 Nuwan Wijewardane

MAY 2016 *

M.S.
 Grant Melotz
 Rupinder Sandhu
 Katherine Smith Werner
 Yan Zhu

Ph.D.
 Charles Newgard,
 Bo Yuan

*Advanced degrees not included in past issues

Student Banquet 2017

Student Awards and Recognition Dinner

Friday April 21, 2017 5pm

Nebraska East Union

Dinner event to recognize graduating seniors in AGEN, BSEN, and MSYM and departmental graduate students.

We will announce the outstanding graduating undergraduate senior in AGEN, BSEN, and MSYM, and graduate student awards, the Stout International Student Award, and the Elenore Gakemeier Swarts Outstanding Graduate Student.

RSVP to Shannon Parry by noon **April 17**
 No charge for dinner for BSE faculty, emeriti, and staff and their guest.

BSE Spring Banquet, Atten: Shannon Parry
 Biological Systems Engineering Department
 200 CHA University of Nebraska-Lincoln
 Lincoln, NE 68583-0726
 Phone: 402-472-3905
 sparry3@unl.edu



Faculty
 Emeriti
 Staff

Plans for the Burr/Fedde Reunion are underway; IANR already has 200 people signed up! The event will be June 10, and includes a breakfast buffet at the East Union, East Campus Open House tours of many facilities, including Larsen Tractor Test & Power Museum, lunch, City Campus athletics tours, a social hour and formal banquet at Cornhusker Hotel.



BURR/FEDDE & FRIENDS REUNION



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The next generation of BSE students could use your help. Your generous donations support student scholarships and special opportunities, as well as equipment for classrooms and laboratories. Please consider making a donation to the Biological Systems Engineering Excellence Fund to provide student programs and scholarships. If you prefer, you can establish your own fund and name it for a family member, friend or mentor.

To arrange a gift, contact:

Josh Egley (CASNR/MSYM)

402-458-1202

josh.egley@nufoundation.org

OR

Justin Carlson (COE, AGEN/BSEN)

402-458-1196

justin.carlson@nufoundation.org