A year-long internship, between the end of high school and the beginning of college in 2008, changed the course of Ashley Schmidt’s life. Working in Mali, Africa, through her church in Omaha, Christ Community Church, she discovered that renewable energy could solve problems compounded by expensive infrastructure for health care in developing countries.

While working at the Women and Children’s Hospital in Koutiala, she noticed that cell phones were prevalent, yet no land lines existed, and deduced that sidestepping the fossil fuel path to developing power could be applied to localized renewable energy needs as well. A reliable and consistent source of electricity, for example, would greatly improve the services the Koutiala hospital offers the surrounding population. The hospital is managed by CPAM (Centre Protestant pour l'Assistance Medical), Christian alliances, and other NGO organizations, with the goal of autonomy for the Malian doctors and staff.

Prior to the internship, Ashley thought her love of math and science would lead her to a career in medicine. After the internship, she discovered that biological systems engineering could provide a flexible career path to helping people too. She began networking with people she knew, one of whom is the CEO of Global Partners in Hope (GPIH; internship in 2007, 2008), in Omaha. GPIH also has a presence in Mali. She talked to Grant Stanley, a friend in Omaha and the founder of Contemporary Analysis; the conclusion they reached was, “Let’s do this.” The World Energy Project, a non-profit organization, was born.

Forming their own non-profit gives them the logistics and flexibility to complete their own projects. She and her team are working with two key people she met in Mali: Dutch engineer, Anco Vanbergeijk, and Daniel Thera, a lawyer, philanthropist, and the founder of the hospital in Koutiala.

Ashley recently spent a week in February in the Bako region (southwest) of Mali. She joined a group of American non-profits, Malian non-profits, Malian government officials, and community leaders as they dedicated the opening of a medical clinic. They also worked on proposals for future collaborations in medicine, safe water, and engineering for the people of the region. She visited the University of Mali in Bamako to continue laying the foundation for establishing educational exchanges between the Nebraska University system and the University of Mali.

Future plans include a month-long trip for six-team members in June 2011, to install solar systems at hospital satellite medical clinics, and to discuss water engineering and solar solutions for other areas in Mali. Ashley is planning to add to the intellectual and financial resources of the organization, to bring renewable, sustainable energy to more people. The World Energy Project has partnered with a number of organizations in the United States and in Mali to provide working solutions to the Bako region in a very practical sense and is excited to continue moving forward with the work in Mali. If you are interested in learning more about their work or supporting this organization, go to: www.worldenergyproject.org.
From the Department Head

In an earlier issue of our newsletter we presented some of the department’s focus on energy, and in another issue the international activities of our students and faculty. In our cover article in this issue we introduce you to Ashley Schmidt and the World Energy Project, a student conceived, developed, and led project that combines those two topics. In another international connection, graduate student Matt Wold became the first and only North American student to receive an International Helmut Claas scholarship, and traveled to Harsewinkel, Germany, to present his research. These are but two of many of our students who are engaged in making a difference. We are very proud of the abilities and commitment of our students, and these are fine examples of what they are achieving.

Two other international activities that I will highlight among many occurring in the department are a study abroad experience and a prestigious recognition of one of our faculty members. In May Dennis Schulte and Adam Liska will lead a group of students to Germany. The title of the course is Lessons in Environmental Sustainability from Germany: Agriculture, Energy, and Resource Management. Also, in August Curt Weller will begin a year long stint as a Jefferson Science Fellow. Jefferson Science Fellows work with either the U.S. Department of State or the U.S. Agency for International Development (USAID) to provide “up-to-date expertise in the rapidly advancing STE (science, technology, and engineering) arenas that routinely impact the policy decisions encountered by the U.S. Department of State/USAID.”

As you peruse the news in this issue you will learn of the education, research, and extension activities of the department as we apply engineering to biological and agricultural systems to provide food, energy, water, and health care to society in better and more efficient ways. We hope you enjoy these articles and invite you to keep in touch with us.

Alumni Reunion

To celebrate the 100th anniversary of the department, an alumni reunion was held on Saturday, September 18. The Department celebrated 100 years of the department and agricultural engineering, 90 years of the Tractor Test Lab, 51 years of mechanized systems management, and 20 years of biological systems engineering. Attendees were treated to tours of Chase Hall, the Tractor Test Museum, and Splinter Labs. A tail-gate style lunch at the Nebraska Tractor Test Lab featured grilled and locally well-known P.O. Pears burgers, brats, and hot dogs, with Dairy Store ice cream for dessert. The group then settled in to watch the Huskers beat the Washington Huskies football team on a large screen.
Shadi Othman joined the faculty in August 2008, and specializes in Magnetic Resonance Imaging (MRI). He heads TREM, the Translational and Regenerative Medicine Imaging Laboratory, where he is assisted in his research by 3 graduate students and 8 undergraduates. He teaches freshman engineering BSEN/AGEN 112, team teaches introduction to biomedical engineering (BSEN 317) for juniors, and introduction to MRI (BSEN 496/896) for seniors and graduate students.

He received his undergraduate B.E. degree from Jordan University of Science and Technology, majoring in Mechanical Engineering. He then studied at the Illinois Institute of Technology and received an M.S. in Mechanical and Aerospace Engineering. His research centered on passive mechanical actuators for controlling cavity resonance in airplanes at supersonic speed. Shadi then decided to pursue an interdisciplinary education in bioengineering, and specialized in high field magnetic resonance imaging. He obtained a Ph.D. from the University of Illinois, Chicago, in Bioengineering, and completed his post-doctoral training at the University of Chicago, where he researched rodent cardiac imaging.

Shadi had the idea that the mechanical actuators he was working with for aerospace engineering could be combined and applied to high field MRI in a technique termed Microscopic Magnetic Resonance Elastography (MRE), which measures the mechanical properties of biological tissues at the microscopic level. Using microscopic MRE, it is possible to monitor the development of engineered tissues, noninvasive cancer biopsies, and how body tissue heals and grows.

At the University of Chicago, he worked with a 9.4-Tesla, 30-cm bore magnet. The magnet in the TREM lab is a 9.4-Tesla, 8.9-cm bore magnet used primarily for mice and specimen imaging. His primary off-campus collaborator is Matt Kelso, an Assistant Professor in the Department of Pharmacy Practice at the University of Nebraska Medical Center. They are monitoring traumatic brain injury (TBI) in mice, using MRE, to determine changes in brain elasticity following TBI in live mice.
Ground breaking for the Sustainable Energy Options for Rural Nebraska project took place at the Haskell Agricultural Lab near Concord. Congressman Fortenberry, who was instrumental in securing funding for the project, attended.

Bill Kranz, (Associate Professor, Northeast Research and Extension Center) the event organizer, said, “Nebraska has abundant wind, solar energy, and crops for fuel feedstock; thus energy independence should be a major goal for rural Nebraska.”

Adam Liska and co-author Richard Perrin were quoted in the New York Times in the Green Blog: Energy and Environment, July 19, 2010, from their article Middle East Oil and the U.S. Military: Securing Foreign Oil: The Case for Including Military Operations in the Climate Change Impact of Fuels. A second article, The Other Gulf Oil Crisis, was published by the McClatchy-Tribune News Service.

Loren Isom (IAPC, Technical Assistance Coordinator), Terry Bartels (IAPC, Research Technician), and Virginia Miller (Department of Agronomy and Horticulture) joined Hybrid Hazelnut Research Consortium members from the UNL Nebraska Forest Service, Rutgers University, Oregon State University, and the Arbor Day Foundation for a hazelnut industry tour in Corvallis, Oregon, in early September. They visited OSU’s hazelnut research orchards and facilities, three commercial hazelnut orchards, two nurseries specializing in hazelnut propagation, and a hazelnut processing facility that supplies confectionary grade hazelnuts. In addition to the industry visits, consortium members conducted extensive progress review and planning sessions for the Consortium’s 3-year grant with the USDA Specialty Crops Block Grant program. For further details on the grant, please see the IANR news release: ianrnews.unl.edu/static/1007210.shtml.

Curt Weller traveled to Savannah, GA, in October to receive the Excellence in Teaching Award presented by the American Association of Cereal Chemists at their annual meeting. He also traveled to Zambia in early December for Intsormil’s workshop on Sorghum Food Enterprise and Technology Development in Southern Africa. In addition to the UNL members and one person from Texas A&M, the attendees were from South Africa, Botswana, Zimbabwe, Zambia, Nigeria, Tanzania, and Ethiopia. The focus of the workshop was sorghum for food and malting.

John Gilley received the Nebraska ASABE section award for Outstanding Contributions to Nebraska Agriculture.

In September, Dennis Schulte attended NOSE, the International Conference on Environmental Odour Monitoring and Control, hosted by the Italian Association of Chemical Engineering, in Florence, Italy. More than 100 worldwide participants discussed new developments in odor technology and regulations. Attention was directed to assessment, measurement, and impact evaluation for agriculture, specific sectors of industry, and civic responsibilities in relation to population density.

Roger Hoy is one of 21 lecturers participating in the 16th year of the UNL Speakers Bureau. This free service connects the citizens of Nebraska with UNL through service organizations, schools, and other groups. Learn more on the Web site: www.speakersbureau.unl.edu

Graeme Quick, a noted Australian Agricultural Engineer, became an honorary Husker when he visited the department. Roger Hoy, Director of the Nebraska Tractor Test Lab, (pictured at right), presented a cap to Graeme after he presented a seminar for our students.
Crystal Powers attended the International Greenhouse Gases in Animal Agriculture meeting in Banff, Alberta, Canada this fall. With a main focus on ruminant animals, researchers, policy makers, educators, and industry representatives from 38 countries (over 400 attendees) gathered to discuss what the best practices are in each of their countries. Finding balances in animal housing, feeding, breeding, and how to meet growing demand for animal products without increasing emissions within the social, cultural, and economic concerns in each region of the world is a complex issue where one solution will not answer every problem. Lots of break out sessions allowed Crystal to meet with many of the participants and gather new ideas for her Extension work in Nebraska.
Loren Isom assisted with the 2010 - Biomass, Research and Development Initiative proposal review process for USDA and DOE in Washington, D.C., Feb. 4 - 8. He joined 28 others to review, discuss, and rank proposals; 4 to 7 projects will be selected to receive a total of $26 million. As a developing grant writer, Loren found that it was a very eye-opening and humbling experience. As a fellow reviewer explained, they were not really selecting the 7 best projects, but finding reasons to throw 60 others out.

Ron Yoder and Dean Eisenhauer were part of a team that visited the UNESCO Institute of Hydraulic and Environmental Engineering (IHE), Institute for Water Education, in Delft, The Netherlands, on February 3 - 4. The seven-member NU delegation was led by Vice Chancellors Prem Paul and Ronnie Green. The meeting was designed to help both institutions assess common goals and gauge the level of mutual benefit from joint research, faculty collaboration, student exchanges, and to develop priority action items to pursue. The IHE Rector has accepted an invitation to participate in NU’s Water for Food Conference in May. During his visit to Lincoln, he will sign a Memorandum of Understanding with President Milliken, which will establish a collaborative relationship between the NU/Daughtery Water for Food Institute and the UNESCO IHE.

The Nebraska On-site Waste Water Association (NOWWA) presented its annual special recognition award to Jan Hygnstrom, Extension Project Manager with BSE, at the February 2011 annual convention held in Lincoln. The award reads, "In gratitude for the outstanding support of the onsite waste water industry and the Association in its formative years." Jan Hygnstrom, Sharon Skipton, and Wayne Woldt helped lay the groundwork for the formation of NOWWA, Nebraska’s professional organization for those in the waste water industry, working to protect human health and the environment, in 2001.

2011 Spring Banquet  Friday, April 15, 2011

The 2011 Spring Banquet featuring a recognition dinner with awards presentations will be held Friday, April 15, 2011, at the Nebraska East Union, Arbor Suite, 3rd Floor. Student Design Exhibits will be on display from 5:30 PM. The dinner will be at 6:30 PM, and the program begins at 7:30 PM. The 2011 BSE Hall of Fame inductees will be announced. This annual event is for alumni, parents, students, faculty, and staff. Make reservations using the form below or the contact information provided.

Complete form to make your reservation. Make checks payable to University of Nebraska-Lincoln

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<th>No. attending</th>
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<tr>
<td>No. attending</td>
<td>@ $12/student = Enclosed</td>
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Plan now to attend
Return reservation by April 8 to:
BSE Spring Banquet
Attn: Eileen Curtis
Biological Systems Engineering Department
200 CHA University of Nebraska—Lincoln
Lincoln, Nebraska 68583-0726
Phone: 402-472-3905
ecurtis1@unl.edu
The department was deeply saddened to learn of the death of Dr. Tim Hindman and his family on February 20, 2011. They had recently moved from Lincoln to an acreage south of Ithaca, NE. He was an engineer for Duncan Aviation. Tim received a B.S. degree in Mechanical Engineering from the University of Nebraska (1990). Tim worked with the Boeing Aircraft Company in Wichita, KS, from 1986 until 1995, when he became a National Needs Research Fellow and student in our department. He received his Ph.D. in Engineering in 2001; Dr. George Meyer was his advisor. Tim was a co-author on several journal articles in the area of weed detection and precision agriculture. However, Tim's professional love was the engineering of aircraft systems and he had found a perfect fit at Duncan Aviation.

Irrigation pioneer Vance Arthur Anderson passed away at the age of 100, in Hastings, NE, in September. He was born in Cushing, and moved to Hastings with his family when he was 13. After he graduated from Hastings High School, he attended UNL for three years. Following in the family business, he was one of the owners, served on the board, and was Vice President of Western Land Roller Company, a vertical turbine irrigation pump manufacturing company, that at the time, served mainly Nebraska and the high plains. (The WLR brand is now owned by the Flowserve Corporation based in Dallas, TX). The company still manufactures the Western Land Roller vertical turbine pump for irrigation, industrial, and municipal applications at their facility in Hastings.

Mr. Anderson received numerous recognitions for his professional and civic (Rotary and DeMolay) achievements and service. Some of the many highlights include: 11 years on the Hastings Public School Board; the Board of Directors of Midwest Irrigation Company of Henderson; 10 years on the UNL Agriculture College Advisory Board; Advisory Council for the College of Engineering, UNL, and the Wayne Madsen Award for community service with the Nebraska Well Drillers Association in 2002. Mr. Anderson published the book, Development of Irrigation Well Drilling in Nebraska in 1981, was inducted into the University Hall of Agricultural Achievement (1982), and the BSE department Hall of Fame (1995). In 2009, he received the Maurice Kremer Ground Water Achievement Award from the Ground Water Foundation.
Comings and Goings

Yixiang Xu, former Research Assistant Professor, accepted a position at Virginia State University as an Assistant Professor of Food Processing and Engineering in the Agricultural Research Station.

Pratik Bhandari, a graduate student advised by Milford Hanna, received a John and Louise Skala Fellowship at the annual Distinguished Fellowship Award Luncheon in October.

Stacey Joy (BSEN from Vermillion, SD) had an interesting summer as an intern with the Indian Health Service (IHS) on the Pine Ridge Indian Reservation in South Dakota, home to the Sioux nation. She learned how to survey and now knows how the surveying data is later utilized. She imported the data into AutoCAD, built surfaces, plotted known obstacles (buildings, fences, roads, etc.), figured out placement of wells and drain fields while following regulations, and found quantities needed to implement the construction designs. She learned all about wells, from start to finish, and the regulations and testing that accompany each drilling. Towards the end of the summer Stacey observed construction to see firsthand how the designs were being built. The poverty on the reservation was a shock for her. She learned that the majority of the people don’t have running water or electricity; services that most of us take for granted simply don’t exist. One thing she realized is that she wants to use her engineering education to be an agent of change and help people, whether here or abroad.

Service Awards

On September 9, more than 1,000 university employees were honored for their years of service, and included the following people from our department.

35 Years
Dean Eisenhauer
Milford Hanna
Louis Leviticus

30 Years
David Morgan

20 Years
Michael Kocher

5 Years
Diann Young

Alum news

2000s

Pengfei Song (2010, M.S., ABSE) is pursuing his Ph.D. at the Mayo Clinic in Rochester, MN.

Tanner Augustin (2006, B.S., BSEN) is working for Medtronic in California. He is an IBHRE Certified Cardiac Device Specialist.

Ivan Leaders (2004, B.S., AGEN) recently moved from Peoria, IL, to Houston, TX. He is a Product Service Engineer for Caterpillar Inc., and serves as the worldwide product support engineer for Caterpillar’s complete line of petroleum powershift transmissions.

Adam Shaver (2004, B.S., BSEN) received his M.S. in cybernetics at the University of Reading in the United Kingdom in 2005. He is a Research Scientist with Numerica Corporation in Loveland, CO.

What’s New?

Update your profile at:

bse.unl.edu

Select Alumni Update under Department heading. Inclusion in the newsletter is optional.

Look for us on Facebook:
Department of Biological Systems Engineering
Become a friend!
Quentin Dudley, a senior biological systems engineering student from Worthington, MN, was the recipient of the Honor Society of Agriculture, Gamma Sigma Delta International Foundation Scholarship. He was initiated in January, 2010. An active participant in department and campus activities, Quentin has served as a new student enrollment orientation leader, performed in the Cornhusker Marching Band, served in the Nebraska Human Resources Institute, and this fall was a member of the Homecoming court.

Matthew Wold, an agricultural engineering graduate student from Thief River Falls, MN, is the first and only North American student to receive one of four International Helmut Claas scholarships. Presented by The CLAAS Foundation, this scholarship is awarded on merit. The mission of The Foundation is “...to make a contribution to education and knowledge in agriculture, intended to show the grand possibilities and perspectives of modern agricultural engineering.” He was flown to Harsewinkel, Germany, Claas world headquarters, at the end of October to present his research on an electronically-controlled Continuously Variable Transmission he designed as an undergraduate student at North Dakota State University. Matt received third place for his work and a scholarship of 3,000 Euros from The CLAAS Foundation.

E-Day Victory

E-Day was held on December 7, in the Great Plains room of the East Union. It was the 5th year of the Incredible, Edible Car competition, the 7th time that E-Day has been held, and the 19th year of a winter poster exhibition to showcase the research and design projects of our students. Also in attendance were company representatives, many of whom are alumni. This year, the team INedible rolled their creation, Mint-Mobile, to sweet victory.
# THE DEAN’S LIST

## Fall Semester 2010

### Agricultural Engineering
- Adam Emanuel
- Mark Hilderbrand*
- Marcus Kuhl*
- Andrew Landgraf
- David Lindquist
- Jonathan McCoy
- Corey Smith
- Joseph Timmons*
- Josh Tomjack

### Biological Systems Engineering
- Catheryn Amenta
- John Bader
- Thomas Bainter
- Bobbi Balogh
- Scott Barker
- Stephanie Berger
- Tyler Borcyk*
- Brenden Boyle
- Anne Bradford
- Jacob Campbell
- Erica Carder
- Emily Cook
- Kristen Cope
- Beth Cowles*
- James Dalton
- Jordan Dau
- Matthew Deveney
- Tim Dornbos
- Elizabeth Dudley
- Quentin Dudley*
- Austin Dudzinski
- Alexander Eggert
- Eric Farris
- Brendan Feehan
- Michaela Fischer
- Anthony Fleck
- Mikayla Freese*
- Ryan Freiberger
- Erica Geis
- Chris Hanson
- Haley Hatter
- Suzanne Higgins*
- Charles Hinds
- Andrew Hollins*
- Elizabeth Hungerford
- Stacey Joy
- Kathleen Kendall*
- Tim Kinoshita*
- Adam Koch
- Ted Kocher
- Monica Krause*
- Olivia Lambdin
- Rachel Lemke*
- Luke Lingenfelter
- Nataniel Mannebach*
- Jonathan McCoy
- Michael McKinney*
- Jeremiah Meints
- Daniel Menter
- Allison Mettler
- Jessica Mills*
- Erik Moore
- Cat Nguyen
- Stephen Novel* 
- Emily Olig
- Jared Ostdiek
- Daniel Owen
- Kathy Parr

### Mechanized Systems Management
- Colton Knickman
- Grant Melotz
- Aaron Shropshire
- Leo Steffel

* indicates 4.0 gpa
August 2010 Graduates

M.S. Agricultural and Biological Systems Engineering

Pengfei Song, Weihai, China
Thesis title: Ultrasound Transient Shear Wave Elasticity Imaging for Tendon Tissue

December 2010

B.S. AGEN

Branden Baade, Artesian, SD
Brady Folck, Bloomfield
Corey Smith, Bertrand
Curtis Thoene, Crofton
Andrew Volkmer, Syracuse

B.S. BSEN

Brad Balogh, Monroe
Scott Barker, Omaha
Nick Behm, Hamilton, MT
Anna Furby, Papillion
Brett Hanika, Lincoln
Bethany Lowndes, Gretna
Michael McKinney, Scottsbluff
Daniel Menter, Linton
Allison Potter, Lincoln
Michael Schaal, Omaha
Brad Staskiewicz, Springfield
University Honors Program
Aaron West, Omaha
Simeng Zhang, Jinan, China
With Distinction

B.S. MSYM

Evan Carlson, Lincoln
A.J. Feldhausen, Papillion
Garret Gustafson, Wakefield
Dan Leiser, Grand Island
Justin Pecka, Raymond
Sam Schmidt, Oakland
C.J. Synak, Lincoln

M.S. Agricultural and Biological Systems Engineering

Jihan Cepeda, Bogota, Colombia
Thesis title: Modeling Heat Transfer During Cooling of Ready-to-Eat Meats

Jessica Deck, Sioux City, IA
Thesis title: Hydraulic Conductivity, Infiltration, and Runoff from Tilled and No-till Cropland

Rajveer Dhillon, Malaut, India
Thesis title: Development of an Integrated Soil Physical Properties Mapping System

Brent Hall, Mt. Liberty, OH
Thesis title: Removal of Low Density Sediments by Vegetative Filters

Chris Howard, Valentine
Thesis title: Testing Fuel Efficiency of Tractor with Both Continuously Variable and Standard Geared Transmissions

Grant Janousek, Leigh

David Rus, Lincoln
Thesis title: Improving Sampling Designs for Estimating Suspended-Sediment Load in the Lower Missouri River

Dipika Singh, Lucknow, India
Thesis title: Identification of Holocarboxylase Synthetase Chromatin Binding Sites in Human Mammary Cell Lines Using the DamID Technology

M.S. Agricultural and Biological Systems Engineering

George Milo Petersen
Jeremy Schreiber

Paul E. and Mary Beth Fischbach
Daran Rudnick

Mr. and Mrs. W.F. Hoppe, Sr.
Derek Williams

John Sulek Memorial
Evan Carlson

Fred R. Nohavec
Gregory Boone

Edgar Rogers Memorial
Grant Melotz
Mark Spangler

Central Plains Irrigation
Curtis Thoene

Elenore Gakemeier Swarts
Jacob Sison-Martinez
Alexander Sellers
Keith Ozanne

Lloyd W. and Margaret V. Hurbut Memorial
Joshua Tomjack
Kurtis Charling

Case New Holland
Wesley Schaaradt
David Lindquist
David Jobman
Corey Smith

AGP Biological Systems Engineering Student
Cody Lange
Noel Menard

Glen D. Chambers
Katherine Smith
Stacey Joy

John Deere Mentor
Adam Maas
David Leinart
A.J. Feldhausen
Marcus Kuhl

Leroy W. and Jeane E. Thom
Rebecca Dornbierer
Wyatt Stubbs
Zachery Tietz
Adam Emanuel
Isaac Welborn
Adam Maas

Ivan D. Wood Memorial
Wesley Niemann
Kalby Weherbein
Aaron Blase

Ken Von Bargen Student Support
Jamie Kathol
Aaron Fuelberth

Dr. and Mrs. William E. Splinter
Emily Hubl

Tom Thompson Memorial
Monica Krause

Leonard G. Schoenbieber
Jared Barjenbruch

Wayne E. and Virginia R. Thurman
Kristine Seier
Matthew Favinger
Danielle Smith
Tyler Scherr
Jonathan McCoy

Leslie and Harriet Jochens
Department of BSE Fund
Timothy Kinoshita

Glenn J. and Maria L. Hoffman
Brooke Micek
2011 Spring Banquet

Plan now to attend
Friday, April 15, 2011

Annual Awards
Recognition
Senior Design
Project Exhibits
BSE 2010 Hall of Fame

See page 6 for reservations

The University of Nebraska–Lincoln is an equal opportunity educator and employer with a comprehensive plan for diversity.